Water Supply Plan

University of Connecticut

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LIST OF ACRONYMS

2020 Plan	2020 Water Supply Plan
ADD	Average day demand
APA(s)	Aquifer protection area(s)
ASF	Assignable square feet
CCR(s)	Consumer Confidence Report(s)
CEPA	Connecticut Environmental Policy Act
cf	cubic feet
cfs	cubic feet per second
CGS	Connecticut General Statute
CI	Capital improvement
CUP	Central Utility Plant
CWC	The Connecticut Water Company
DBPR	Disinfection Byproducts Rule
DEEP	Department of Energy and Environmental Protection
DOC	Department of Corrections
DPH	Department of Public Health
EHS	Environmental Health and Safety
EIE	Environmental Impact Evaluation
EPA	Environmental Protection Agency
ESA(s)	Exclusive service area(s)
ESB	Engineering and Science Building
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
gpcd	Gallons per capita day
gpd	Gallons per day
gph	Gallons per hour
gpm	Gallons per Minute
GWUDI	Groundwater under the direct influence of surface water
HAA5	Haleoacetic acids
hcf	hundred cubic feet
IPB	Innovation Partnership Building
ISO	Insurance Services Organization
kV	Kilovolt
kW	Kilowatt
LEED	Leadership in Energy and Environmental Design
LST	Line shaft turbine
MCL(s)	Maximum contaminant level(s)
MG	Million gallons
mgd	Million gallons per day
mg/L	milligrams per liter
MMADD	Maximum month average day demand
MMI	Milone & MacBroom, Inc.
MT-POCD	"Mansfield Tomorrow" Plan of Conservation and Development
MTS	Mansfield Training School
NA	Not applicable
NEWUS	New England Water Utility Services
NextGen	Next Generation Connecticut
OB	Operating budget
OPM	Office of Policy and Management
OS	Outside sources
PDD	Peak day demand
PHC	Public Health Code
psi	Pounds per square inch
PURA	Public Utility Regulatory Authority
PWSMA	Public water supply management area
RCSA	Regulations of Connecticut State Agencies
RO	Reverse osmosis
RWF	Reclaimed Water Facility
SCADA	Supervisory control and data acquisition
SDWA	Safe Drinking Water Act
SDSs	Safety Data Sheets
sf	Square feet
SFHA	Special Flood Hazard Area
SOCs	Synthetic organic compounds
STEM	Science Technology Engineering and Math
SUB	Submersible
TBD	To be determined
TDH	Total dynamic head
TTHM	Total trihalomethanes
UConn	University of Connecticut
UPDC	University Planning, Development, and Construction
USGS	United States Geological Survey
UV	Ultraviolet light
V	Volt
VFD	Variable frequency drive
VOCs	Volatile organic compounds
WPCF	Water Pollution Control Facility
WUCC	Water Utility Coordinating Committee

1.0 INTRODUCTION

The University of Connecticut ("UConn") currently provides potable water to its Storrs (Main) Campus and Depot Campus located in Mansfield, Connecticut. UConn, with the assistance of Milone & MacBroom, Inc. (MMI), has prepared this 2020 *Water Supply Plan* (*2020 Plan*) to update the previous *Water Supply Plan* dated May 2011. Figure 1-1 depicts the area currently served by the UConn water supply system serving the Main Campus and Depot Campus, which are together identified as public water system #CT0780021 by the Connecticut Department of Public Health (DPH)[1].

1.1 Background

Certain regulated water utilities in Connecticut must complete water supply plans in accordance with Section 25-32d of the Connecticut General Statutes (CGS) and Section 25-32d of the Regulations of Connecticut State Agencies (RCSA), namely the updated water supply planning regulations[2] adopted in 2005. The water supply planning regulations and supporting statutes recognize that planning is a critical management activity for all water utilities. The principal goals of water system planning as defined by DPH are to: (1) ensure an adequate quantity of pure drinking water, now and in the future; (2) ensure orderly growth of the system; and (3) make efficient use of available resources.

Although UConn is not considered a "water company" as set forth in CGS Section 25-32a, UConn still views the *Water Supply Plan* as an integral device in planning for a safe and adequate water supply system for the foreseeable future. Thus, the *2020 Plan* addresses (to the extent practical) the requirements of CGS Section 25-32d and UConn will distribute the *2020 Plan* to required State agencies and other required parties for review and comment.

Historically, UConn has been fortunate to have access to high quality drinking water through its Fenton River and Willimantic River wellfields. These resources have served UConn for decades and will continue to serve UConn for years to come. Currently, UConn may withdraw water from seven production wells as well as a recently installed public water supply interconnection (described in more detail below), with an eighth well reserved as emergency backup. A total of four production wells are located at each of the two wellfields. Seven of the eight wells are gravel packed wells, and all eight wells are constructed as high-capacity wells in stratified drift.

The "Fenton River Study" of 2006 and the "Willimantic River Study" of 2010 have demonstrated that normal operation of the wells to supply potable water for the Storrs and Depot Campuses can result in some diminution of river flows in times of drought. Also, under certain low river flow conditions, extended pumping may result in adverse environmental impacts. As such, both wellfields have been recently operated in accordance with the individual management plans that have been consolidated in the *Wellfield Management Plan* document associated with the *2020 Plan*.

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[1] https://portal.ct.gov/DPH/Drinking-Water/DWS/Public-Water-System-Lists
[2] https://eregulations.ct.gov/eRegsPortal/Browse/RCSA/Title_25Subtitle_25-32d/

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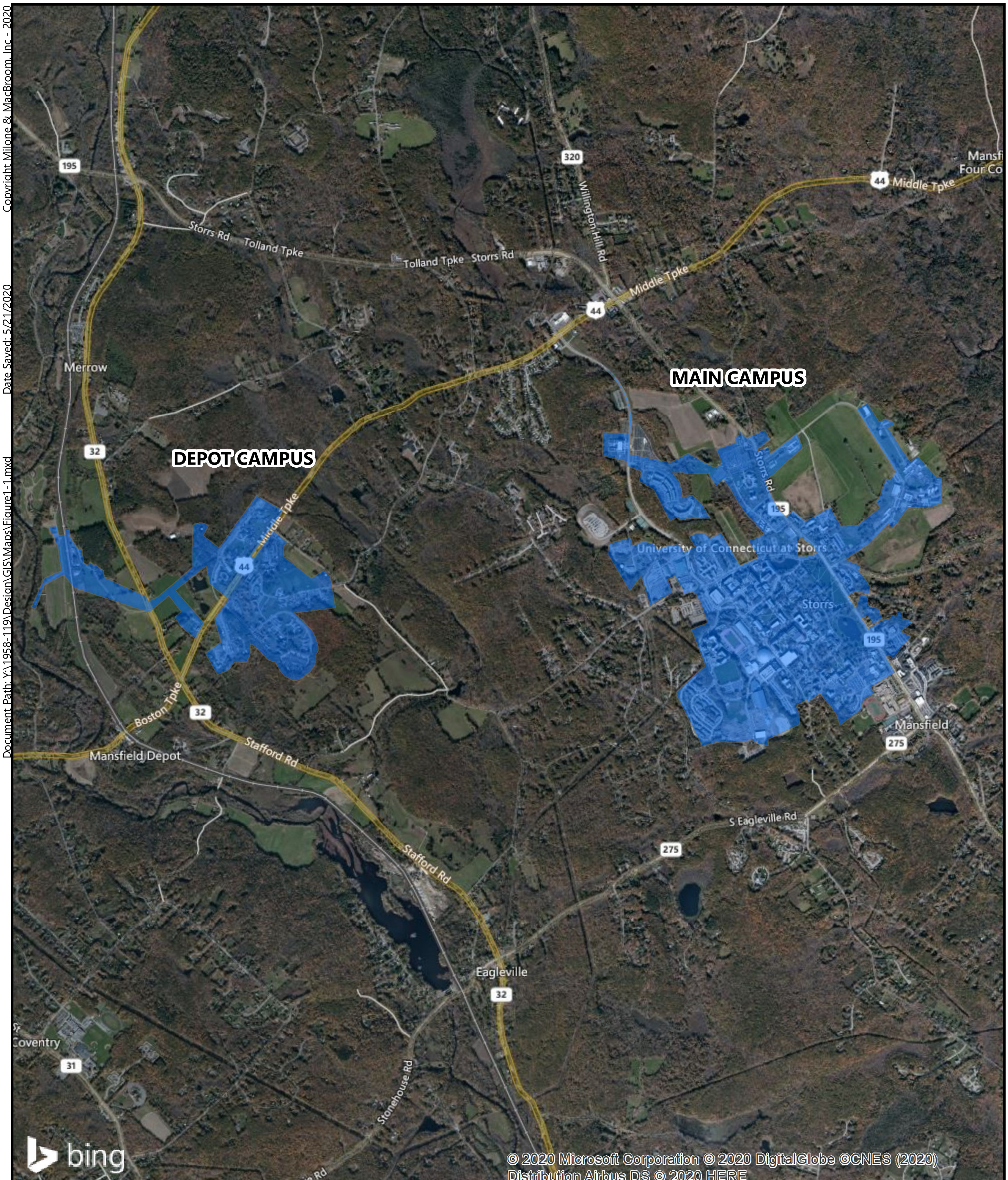

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UCONN WATER SERVICE AREA

WATER SUPPLY PLAN
UNIVERSITY OF CONNECTICUT
MAIN AND DEPOT CAMPUSES
MANSFIELD, CT

N

0 1,000 2,000
Feet

SCALE	1 " = 3,000 '
DATE	5/21/2020
PROJ. NO.	1958-119

FIG. 1-1

Furthermore, UConn also has a considerable amount of water storage capacity with over eight-million gallons (MG) of potable water storage available. This storage volume, in combination with the UConn's booster pump capacity and various sources of supply, enables the UConn to accommodate all its system demands, including peak day demand (PDD). UConn could, in theory, turn off its wellfields and be able to meet typical demands from storage alone for several days.

Finally, UConn's supply and distribution system includes a water treatment facility at each wellfield, four booster pumping stations, 6 water storage tanks, and approximately 31 miles of water transmission and distribution mains. These resources are described in more detail in subsequent sections of this *2020 Plan*.

1.2 Major Changes Since the Previous *Water Supply Plan*

The May 2011 *Water Supply Plan* was last revised by UConn in December 2013 based on review and comment provided by several State agencies through the DPH. In an approval letter dated March 25, 2014, the DPH memorialized state agency input and requested UConn address the comments in the next *Water Supply Plan* that was to be prepared within 9 years of May 2011 *Water Supply Plan*. The *2020 Plan* addresses, to the extent practical, the March 2014 DPH comments. Similar to previous plans, the *2020 Plan* covers the entire water system.

UConn now utilizes an on-site Reclaimed Water Facility (RWF) on the Storrs Campus as a source of treated wastewater that is used to replace the use of potable water for non-potable uses. Since the spring of 2013, the RWF has provided the UConn Central Utility Plant (CUP) with water for evaporative cooling and boiler make-up. Reclaimed water is also used for flushing toilets and for the cooling system in the Innovation Partnership Building (IPB) that was constructed in 2015-2017 and opened in September 2018. UConn has applied for a permit to use reclaimed water for flushing toilets at the recently constructed Werth Residential Tower Building, and activation of this portion of the reclaimed water system is on hold pending permit approval. The average day production for the RWF in 2019 was approximately 0.33 million gallons per day (mgd). Demand analyses for reclaimed water which are included in the *2020 Plan* factor wastewater reuse as a deduction from what the overall potable water demand would otherwise have been if reclaimed water were not available.

In December 2016, the UConn water system completed an interconnection with The Connecticut Water Company (CWC) – Northern Operations, Western System via a 16-inch diameter regional pipeline which extended approximately 5.3 miles from Tolland to UConn along Route 195. The interconnection allows UConn to purchase supplemental water if and when on-campus potable water demand exceeds what the UConn's wellfield sources are allowed to supply under current *Wellfield Management Plan* protocols. CWC's water supply source for the interconnection is the Shenipsit Reservoir, which is located along the boundary between Tolland, Ellington, and Vernon, Connecticut. Note that purchases through the interconnection in this manner have not been made to date.

Nevertheless, the interconnection is actively used as water delivered through the CWC interconnection supplies potable water to off-campus premises in Mansfield that were previously supplied by the UConn water system. All off-campus premises, including those that are UConn-owned, are now customers of CWC. Furthermore, all off-campus potable water infrastructure is either owned by or is under the direct control of CWC via a licensing agreement with UConn and the Town of Mansfield. When the interconnection was completed, CWC was assigned the responsibility to provide potable water service to all off-campus areas previously served by UConn's potable water system in Mansfield consistent with CWC's exclusive service area (ESA) responsibilities under CGS Section 25-33g and RCSA 25-33h-1(k). As such, the off-campus water use that had previously been included as part of the demand on the UConn water system in prior versions of the UConn *Water Supply Plan* are no longer included in the demand volumes noted for the UConn water system in this *2020 Plan*

Taken together, all the above actions have greatly reduced the average day demand (ADD) on the UConn water system. At the time of the previous *Water Supply Plan* in 2011, the ADD on the water system was 1.29 mgd. The ADD on the system was only 0.72 mgd in 2019, reflecting a savings of nearly 0.6 mgd over that eight-year timeframe. UConn anticipates that demands will increase in the future as opportunities in its various master planning documents for the Main and Depot campuses are realized, although future demands are expected to be mitigated by various water efficiency programs.

1.3 Planning for the Future

UConn has experienced steady growth over the past two decades both in terms of enrollment and the number of campus buildings served by the water system. Nevertheless, the construction and development that has been completed, and is presently planned as part of the "UConn 2000", "21st Century UConn", and "Next Generation Connecticut" initiatives have not adversely stressed the UConn water system. In fact, UConn is using less water today than it did back in the 1980s and early-to-mid 1990s. This reduction in water use was achieved by water conservation efforts, public information campaigns through the Office of Sustainability, and capital improvement programs aimed at reducing water leakage, water waste, and overall consumption. Furthermore, use of reclaimed water produced in the UConn RWF is contributing to the decrease in potable water pumping from UConn's sources of supply, while programmatic maintenance and renovations on the aged steam and condensate systems continue to promote water conservation by reducing system leakage rates.

Water efficiency programs have been a key component of UConn's continuing growth and expansion as Connecticut's flagstaff academic institution. UConn continues to be committed to conserving water and installing water efficient devices in new construction, consistent with sustainability initiatives on water conservation and building efficiency measures (e.g., State of Connecticut High Performance Building Standards and Leadership in Energy and Environmental Design [LEED] requirements) outlined in UConn's Construction Design Guidelines & Performance Standards.

Similar to the 2011 *Water Supply Plan*, this *2020 Plan* evaluates various components of the UConn water system for the 5-, 20-, and 50-year planning periods. By regulation, the 5-year planning period is projected from the year of the plan preparation (2020), while the 20- and 50-year planning periods are projected from the year of the most recent decennial census (2020). Accordingly, the planning periods correspond to the years 2025, 2040 and 2070, respectively.

This *2020 Plan* assesses the ability of UConn to meet the intended goals of the various Statutes and Regulations overseen by DPH related to public water supply and outlines capital improvements and operations necessary to meet those goals in the future. The information contained in this *2020 Plan* was obtained from a variety of sources, including a review of UConn files and written and verbal information obtained from UConn staff and contractors. Additional information was obtained from a review of reports and records relative to the water supply system that were formulated since 2011. Where appropriate, portions of these documents have been incorporated.

Certain water supply budgetary estimates are referenced in this document. These are preliminary estimates and are intended to be used for planning purposes only. Opinions of probable capital and operational costs are based on best estimates using data available in 2019 and 2020. Actual costs may substantially vary from the costs reported in this planning document.

1.4 Acknowledgments

Special thanks are given to the following individuals for their time, effort, and input throughout the preparation of this updated *Water Supply Plan*:

- Mr. Stanley Nolan, Director of Utility Operations & Energy Management, Facilities Operations
- Ms. Katie Milardo, Water & Compliance Manager, Facilities Operations
- Mr. James Hutton, Environmental Compliance Professional, Environmental Health and Safety
- Mr. Brant Buhler, Chief Operator, New England Water Utility Services
- Mr. Pete Duncan, S. B. Church Company

2.0 WATER UTILITY STRUCTURE AND ASSETS

2.1 Historical Perspective

The water system at UConn consists of wells and infrastructure developed by UConn, wells and infrastructure developed by the former Mansfield Training School (MTS), and (since 2016) the infrastructure installed to complete the CWC interconnection. As such, the chronology of water system development is of interest and importance. The following historical information was presented in previous *Water Supply Plans* issued in 1999, 2004, and 2011, with supplemental information from recent reports, as well as a variety of other sources.

1880 – 1910:

- The Connecticut General Assembly established the Storrs Agricultural School in 1881 after accepting 170 acres of land, several buildings, and money from Charles and Augustus Storrs. The Storrs Agricultural School opened on September 28, 1881 with 12 students.
- The name of the agricultural school was changed to Storrs Agricultural College in 1893, and the name was again changed to the Connecticut Agricultural College in 1899.
- It is speculated that the source of water during this time was a shallow dug well (or wells) on the main campus.
- In 1905 or 1906, the College's annual report recommended elimination of an eastward sewage outfall to avoid a possible typhoid infection of the City of Willimantic water supply. Eliminating the eastward sewage outfall would allow for future development of the Fenton River well field on UConn property without the risk of sewage contamination.

1910 – 1920:

- The College's biennial report for 1912-1914 quoted the president as saying "The sewage from the eastern side of campus, the drainage from which is toward the Fenton River, the source of the City of Willimantic water supply, is now diverted and filtered, the effluent finding its way to the Willimantic River on the opposite side of the watershed."
- The first MTS buildings were constructed on the site of the present Depot Campus from 1910 to 1919. This facility was a self-sufficient residential hospital complex and its lands included the present site of the Willimantic River Wellfield.
- According to the United States Geological Survey (USGS)[3], the water source was a 240-inch diameter dug well at the Willimantic River Wellfield installed to a depth of 16.5 feet around the year 1913. This dug well was known as MTS Well #1.
- In 1914, UConn erected a 0.3 MG standpipe for water storage at what is now the Towers site. The source of water that was pumped to the 0.3 MG standpipe is not known.

1920 – 1930:

- In 1921, the Town of Mansfield reportedly constructed a water treatment plant at Pink Ravine at the intersection of Bonemill Road and Ravine Road. The plant treated water from Cedar Swamp Brook using rapid sand filtration and utilized a pump station to supply both MTS and UConn. The demand at this facility was reportedly 100,000 gallons per day (gpd).
- A 6-inch pipeline is believed to have extended along Bonemill Road from Pink Ravine in both directions (towards MTS and towards UConn). Portions of this old main served the former

[3] https://pubs.usgs.gov/ctwrb/0012/report.pdf

poultry facility on Bonemill Road north of Pink Ravine and a nearby pasture. The line was capped off beyond the poultry facility in June of 1999, and later capped again on North Eagleville Road at Meadowood Road.

- With State funds awarded to the College and the Town of Mansfield, the College developed Well A at the Fenton River in 1926-1927 to replace the Pink Ravine water treatment plant. A ten-inch pipeline connected Well A to the College, with water stored in two water tanks on campus. The first tank was the 0.3 MG installed in 1914 at the current Towers site. The location of the second water tank is unknown but likely was at the Towers site.
- The Pink Ravine water plant was reportedly disconnected from UConn in 1927 after the development of Well A, although it is possible that the facility continued to serve MTS and may have been considered an emergency back-up source by UConn.

1930 – 1940:

- In 1933, the Connecticut Agricultural College became the Connecticut State College, and in 1939 was renamed UConn.
- 1934 aerial photographs[4] show three water storage tanks in close proximity at MTS near the location of the single 0.75 MG tank which is north of Route 44. Two of the three tanks in the photographs appear to be of a similar size and are installed adjacent to each other while a third smaller tank is located to the southwest. The photographs also depict the recently replaced chemical treatment building at the Willimantic River Wellfield, suggesting that a treatment building for MTS was in place prior to 1934.
- The 1934 aerial photographs show two water storage tanks at the present-day Towers site. One of these tanks appears to be the 0.3 MG tank constructed in 1914. The size and construction date of the second Towers site tank in the 1934 photograph is unknown but may have been completed either before or around the time Well A was installed.
- The graduate school was established in 1940.

1940 – 1950:

- MTS performed investigations in the early 1940s culminating in a 1945 report on water supply facilities and a yield test of MTS Well #1. MTS Well #1 was supplemented by the installation of MTS Well #2 in 1948.
- UConn evaluated Well A in the early 1940s, which was typically operated at night due to power supply limitations and costs. It was determined that additional supply was needed.
- In 1949, UConn developed Well B and Well C at the Fenton River Wellfield. UConn also constructed a 50,000-gallon (twin 25,000-gallon) clearwell basin at the Fenton River Wellfield in 1949.

1950 – 1960:

- A 0.6 MG storage tank was reportedly constructed at the Towers site in 1950, and likely replaced one of the two tanks shown in the 1934 photograph.
- The present-day 1.0 MG storage tank at the Towers site (the third tank at this location) was constructed in 1954.
- UConn constructed a 1,000 gallons per minute (gpm) pumping and treatment station and a 12-inch pipeline from the Fenton River Wellfield to the campus in 1954.
- MTS constructed a 0.5 MG storage tank in 1954 on the east side of the school, south of Route 44, and in 1958 constructed a 0.75 MG water storage tank near the existing tanks north of Route 44. The residential population of MTS was nearing its peak at that time.
- MTS constructed MTS Well #3 at the Willimantic River Wellfield in 1958. This well was intended

[4] http://magic.lib.uconn.edu/mash_up/aerial_index.html

to supplement MTS Well #2, and MTS Well #1 became an emergency (backup) source for potable water.

- UConn constructed Well D at the Fenton River Wellfield in 1958 at a location south of Fenton River Wells A, B, and C.

1960 – 1970:

- MTS Well #1 was disconnected in 1961 due to insufficient yield.
- The MTS water system was reportedly "interconnected" with the UConn system in 1964 to provide redundancy to both systems. This interconnection likely utilized the existing 6-inch main along Bone Mill Road that had been in place since the 1920s and had technically interconnected the two systems since that time, although transfer pumps to move water from one system to another may not have been in place prior to the 1960s.
- The 1965 aerial photographs show the recently (1950s) constructed water tanks at MTS and the main campus. The 0.75 MG tank installed in 1958 at MTS appears to have replaced one of the "twin" tanks that was located between the smaller tank and the other "twin" tank. Three tanks are also shown at the Towers site in this photograph, which appear to be the 0.3, 0.6, and 1.0 MG tanks noted previously.
- In 1969, UConn reached an agreement with MTS where UConn would be granted exclusive use of the land at the Willimantic River Wellfield and certain parcels surrounding MTS. This agreement included MTS Well #1, MTS Well #3, the treatment building, and the water storage towers northwest of Route 44. UConn would provide MTS with potable water. MTS retained ownership and usage of MTS Well #2 as an emergency source and the Bone Mill Road 0.5 MG tank for water storage. MTS Well #2 was used as a backup well and was typically run for a few months each year, through 1990, to supplement the UConn water supply. UConn renamed MTS Well #3 to UConn Well #3.

1970 – 1980:

- UConn installed Well #1 in 1970 and installed Well #2 in 1974 at the Willimantic River Wellfield.
- A 1971 report noted that fire flows were inadequate on the edges of the distribution system. Water mains were reportedly cleaned to increase pressure.
- A 5.4 MG underground storage reservoir was built at W-lot on the Storrs Campus in 1972, with a water treatment facility and a pumping station that pumped water to the storage tanks at the Towers site. The Willimantic River Wellfield was connected to the new 5.4 MG reservoir with a 4.5-mile, 16-inch diameter water-transmission main.
- The 0.6 MG tank (constructed in 1950) and the 1.0 MG tank (constructed in 1954) at Towers site were overhauled in 1980.

1980 – 1990:

- UConn registered its seven wells with the Connecticut Department of Energy and Environmental Protection (DEEP) in 1982. MTS registered MTS Well #2 separately.
- UConn extended its system to 11 homes on Hunting Lodge Road where owners were concerned about potential well contamination. These were the first non-MTS off-campus customers.
- A propane emergency generator was installed at UConn Well #3 in 1986. Two 1,000-gallon underground propane tanks were located at the wellfield; these have since been replaced with above-grade tanks.
- Cracks in the 5.4 MG reservoir were filled and the top of the tank was resealed in 1987.
- In 1988, 15 additional homes, the Storrs Friends Meeting House, and Celeron Square Apartments were connected to the potable water system on Hunting Lodge Road.
- The Town of Mansfield and UConn entered into a "Sewer & Water Service Agreement" in January 1989. UConn agreed to provide services in the South Eagleville Road and Maple Road area to

various Town-owned buildings. This agreement has been superseded.

- UConn submitted its first *Water Supply Plan* to the Department of Health Services (now DPH) in 1989. Water usage at UConn peaked in 1989.
- UConn commissioned an inspection of the 0.3 MG storage tank at Towers in 1989.
- UConn installed a diesel generator for emergency power at Well #1 in 1990.
- UConn commissioned an inspection of the 0.6 MG storage tank at Towers in 1990.

1990 – 1995:

- UConn commissioned an inspection of the 5.4 MG reservoir in 1991. Cracks in the tank were filled and the top of the tank was re-sealed that year.
- UConn commissioned an inspection of the 1.0 MG storage tank at Towers in 1991.
- UConn conducted leak detection surveys at MTS and corrected deficiencies in 1991 and 1993.
- UConn removed the propane tank next to MTS Well #2 in June 1993.
- MTS was closed and officially transferred to UConn on July 1, 1993. As such, MTS Well #2 came under the control of UConn. The MTS campus became known as the Depot Campus.
- UConn submitted a revision of its first water supply plan in 1993 with updates in 1994 to reflect the closure of MTS.
- UConn Well #2 was redeveloped in 1993-1994.
- UConn commissioned an inspection of the 0.75 MG storage tank in 1993 and the 0.5 MG storage tank in 1994 at the Depot campus.
- UConn conducted a Groundwater Under the Direct Influence of surface water (GWUDI) study from 1993 to 1994. It was subsequently determined that the tested wells were not under the direct influence of surface water.
- UConn constructed a generator building and installed an emergency generator at the Fenton Wellfield in 1994. This structure provides emergency power to all four Fenton wells and the pump house.
- The UConn 2000 legislation (Public Act 95-230) passed in 1995, providing $96 million in funding to rebuild and renew UConn. This amount was later increased to one billion dollars in a ten-year program.
- The registration for MTS Well #2 was transferred to UConn in August 1995.
- Water treatment facilities were replaced in 1995.

1996 – 2000:

- In 1996, UConn contracted a firm to conduct a leak detection survey at the Depot Campus and at problem areas associated with the Main Campus. Noted deficiencies were repaired.
- The levels of lead and copper in the Depot Campus system exceeded the action level in 1996. This issue was subsequently corrected by adjusting the pH at the Willimantic River Wellfield treatment building.
- UConn constructed Well #4 at the Willimantic River Wellfield in 1998 to replace the function of MTS Well #2. This well was installed nearby MTS Well #2, which is now inactive.
- UConn officially abandoned MTS Well #1 in December 1998 and dismantled the associated pump house.
- Most of the residences on Hunting Lodge Road were connected to the water system by the end of 1998.
- Two booster pumps were constructed in 1998 to address fire protection pressure problems. The first was installed in the CUP and the other was installed in the new South Campus Chiller Plant. New and renovated buildings in the UConn 2000 program also installed sprinkler systems to provide more efficient fire protection.
- UConn submitted its second *Water Supply Plan* in 1999.
- A totalizing meter was installed on each Fenton well in 1999. Prior to this time, only the total flow from the wellfield was metered.
- The storage tanks at the Depot campus were rehabilitated and repainted in 1999 and 2000.

2000 – 2005:

- UConn revised its second *Water Supply Plan* for approval in 2001.

- Level A Mapping of the Fenton River Wellfield was completed in 2001.
- The Town of Mansfield prepared its own *Water Supply Plan* in 2002.
- The maximum contaminant level of total coliform bacteria was exceeded in October 2001 and September 2003 in the main campus system. During follow up water quality testing, no *E. Coli* bacteria were found in any of the samples. Mechanical problems at the chlorinators were believed to have caused these incidents. Repairs were made and the public was notified.
- An elevated level of fluoride was detected in a sample at the Fenton River pump station in December 2002. Subsequent samples were within the normal range. Public notification was made.
- UConn had a monitoring and reporting violation in its December 2002 water samples. The sample submitted for cyanide was considered "unsatisfactory for examination" by the laboratory. UConn re-sampled for cyanide in January 2003 (none was detected) and issued public notification regarding the violation.
- The Towers Loop Pump Station was activated in 2003. This facility services the Charter Oak Apartments/Suites and the Husky Village (Greek Housing) complexes.
- Based on the success of the UConn 2000 program, the Connecticut General Assembly enacted the "21st Century UConn" legislation in 2003 that committed an additional $1.3 billion dollars for the continuation of capital improvement programs.
- Approximately seven residential dwellings on Meadowood Road and North Eagleville Road were connected to the water system in 2004.
- UConn submitted its third *Water Supply Plan* in 2004 (approved in 2006).

<u>2005 – 2010:</u>

- A series of events in summer 2005 lead to the desiccation of a section of the Fenton River. These events included drought conditions and low river flows, high demands for potable water upon the return of students in August-September, high non-potable water demands at the CUP, and a water management scheme that, at the time, caused more water to be withdrawn from the Fenton River Wells than current practice tends to allow.
- The "Fenton River Study" was completed in 2006. This report suggested successive cutbacks in the pumping rate of the Fenton River Wellfield during natural surface water low-flow periods, with wellfield shutdown occurring when the Fenton River is flowing below 3.0 cubic feet per second (cfs). In the summer of 2006, UConn began operating the Fenton River Wellfield as suggested by the study.
- UConn hired a contract operator to oversee operations of the water system in 2006.
- Revised Level A Mapping of the Willimantic River Wellfield was completed in 2007 and subsequently approved by DEEP.
- The UConn's Water and Wastewater Advisory Committee convened in 2007. The committee included UConn and Town of Mansfield officials. These officials continued to meet through 2016 on a quarterly basis to discuss growth and usage of the water and wastewater systems.
- UConn prepared a *Water and Wastewater Master Plan* in 2007 that was subsequently approved by DPH. The *Water and Wastewater Master Plan* provided a comprehensive review of the existing water and wastewater infrastructure, a summary of operations and management of both systems, an inventory of future infrastructure needs, and a discussion of potential future water supplies.
- UConn prepared a draft *Drought Response Plan* in 2008 that tied projected available water supply to projected usage and set five stages of water conservation measures.
- The "Willimantic River Study" was completed in 2010. This report suggested successive levels of voluntary and mandatory conservation measures be instituted by water users to reduce production at the Willimantic River Wellfield during low-flow periods.
- UConn began operating the Willimantic River Wellfield as suggested by the Willimantic River Study in the summer of 2010, with the

understanding that a *Wellfield Management Plan* would be included as part of the 2011 *Water Supply Plan*, as well as future plans, to formalize operations for the two wellfields (including water conservation and water restriction measures).

2010 – 2015:

- The two smaller Towers site water storage tanks (0.6 MG and 0.3 MG) were replaced with one, new 1.0 MG tank in 2010-2011 sited adjacent to the 1.0 MG tank installed in 1954.
- The Willimantic River Wellfield chemical treatment facility was replaced in 2010-2011.
- UConn prepared its fourth *Water Supply Plan* in 2011 and received DPH approval in March 2014. The approval letter for the 2011 *Water Supply Plan* noted the State's understanding that agency comments provided to UConn would be addressed in future *Water Supply Plan* revisions.
- Construction of the RWF began in 2011 and was completed in spring 2013. Since completion of the RWF, the CUP has received treated water for reuse as boiler make-up water and as evaporative cooling water in the production of chilled water and cogenerated power and heat.
- UConn prepared an *Environmental Impact Evaluation for Potential Sources of Water Supply* in 2011-2012, which identified the CWC interconnection as the most prudent option for new water supply. The corresponding Record of Decision received approval from the Connecticut Office of Policy and Management in 2013.
- In December 2013, UConn and CWC executed a "Water Supply and Development Agreement" for the construction of water transmission line piping and provision of water to UConn and off-campus customers. The new interconnection consisted of a 16-inch diameter pipeline extending from existing CWC infrastructure in the Town of Tolland.
- UConn and CWC jointly submitted a Diversion Permit application to DEEP in 2014 for the construction and operation of the water supply interconnection pipeline.
- Construction of three of four Storrs Center phases, consisting of mixed-use commercial spaces and residential apartments, was completed by the end 2014. The fourth phase of condominiums and townhomes began construction in 2015. Water supply to the commercial and residential buildings at Storrs Center is presently provided by CWC through the CWC interconnection pipeline and associated off-campus water systems.

Recent Improvements:

- UConn replaced the 16-inch diameter water transmission main between the Willimantic Wellfield and the 5.4 MG W-Lot reservoir in two phases spanning 2015-2017. This enhanced reliability of water transmission to the Main Campus.
- The 20-inch diameter section of main connecting the W-Lot (High Head) reservoir to the Towers storage tanks was replaced in 2016-2017.
- The interconnection from the CWC Northern Operations Western System was activated in December 2016. All off-campus infrastructure was licensed to CWC for their use, and nearly all off-campus connections that were formerly customers of UConn became customers of CWC upon activation of the interconnection. The changeover for off-campus customers was completed in early 2017.
- Several recent building projects on campus incorporate features that use reclaimed water instead of potable water to further water conservation efforts. The Engineering & Science Building (constructed 2017) uses reclaimed water for toilet flushing, and the recently completed IPB uses reclaimed water in its cooling towers. Infrastructure is also in place to use reclaimed water in the Werth Residential Tower for cooling and toilet flushing, with connection to occur pending permit approval.

2.2 Organizational Structure

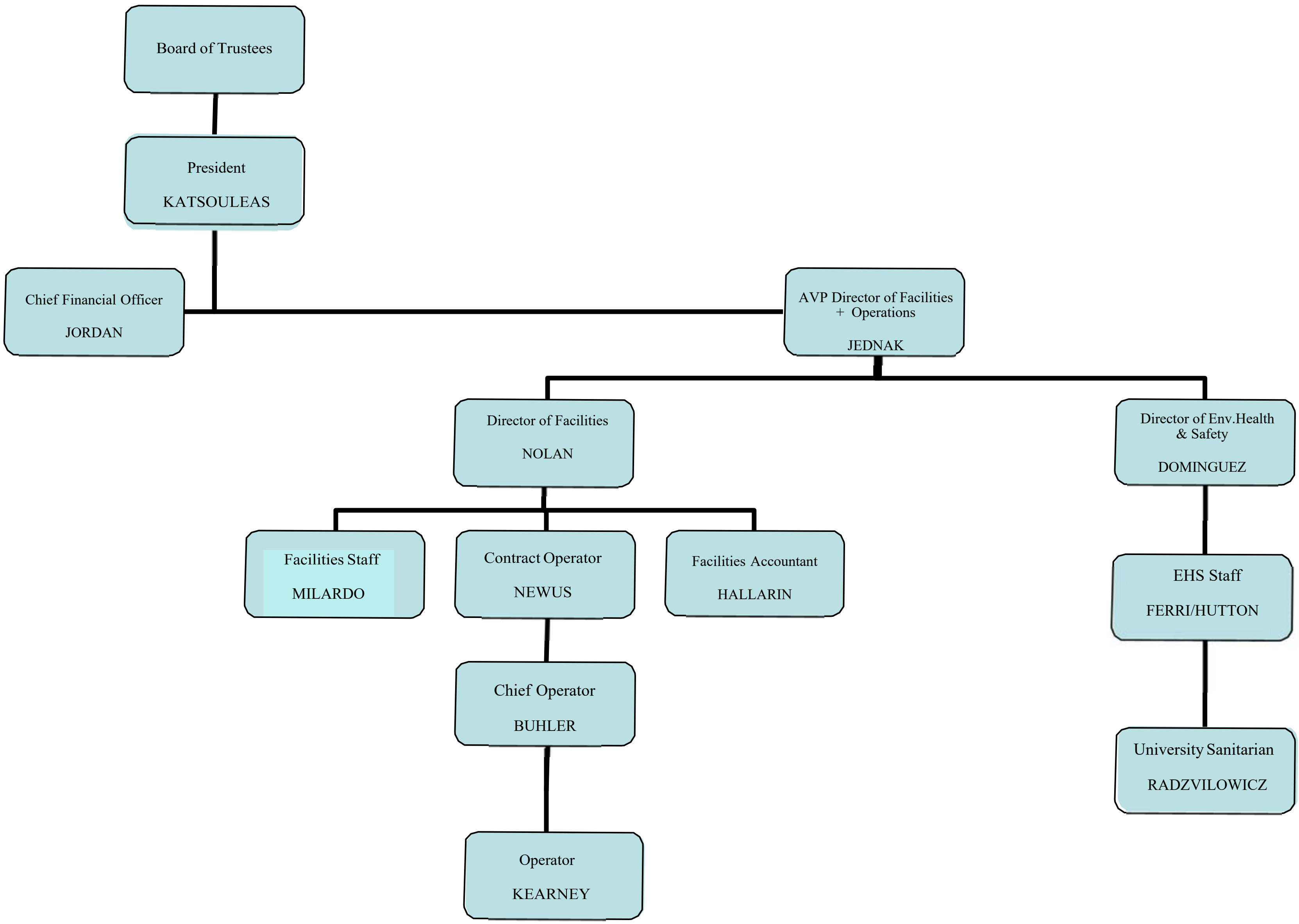
The UConn water system is owned and controlled by UConn. An organizational chart related to water system management is included as Figure 2-1. The Board of Trustees serves as the ultimate governing body on all drinking water matters concerning these systems. UConn administration related to the water system includes the following:

- Mr. Thomas Katsouleas is the President of UConn and oversees the day-to-day operation of the university.
- Mr. Scott Jordan is Executive Vice President for Administration & Chief Financial Officer.
- Mr. Michael Jednak is the Associate Vice President of Facilities Operations & Building Services and he is responsible for oversight of construction contracts, operation contracts, and cross-connection control improvements; oversight of all utilities; and billing. Assistance to Mr. Jednak is provided by the following individuals:
    - Mr. Stanley Nolan is the Director of Utility Operations & Energy Management within Facilities Operations. Mr. Nolan is assisted in water utility operations by Ms. Katie Milardo the Water & Compliance Manager.
    - Mr. Eric Kruger is the Director of Trade Services.
    - Mr. Mickey Gorman is the Manager of Trade Services.
    - Ms. Lynn Hallorin is the Director of the Business Services Center.
- Ms. Laura Cruickshank is the Master Planner and Chief Architect for the university. She is responsible for architectural and engineering matters including "Next Generation Connecticut" (NextGen) projects. Her Office of University Planning, Development, and Construction (UPDC) also oversees contracts pertaining to construction which covers major water system infrastructure projects.
- Ms. Teresa Dominguez is the Director of Environmental Health and Safety (EHS). She is responsible for the team that oversees environmental compliance in planning, construction, permitting, and operational decisions, including those related to water supply
    - Ms. Dominguez is assisted by Mr. James Hutton from the EHS group and Ms. Katie Milardo from the Facilities Operations group on matters related to water supply.

The contract operator for the UConn water system is New England Water Utility Services (NEWUS), a subsidiary of CWC. NEWUS has been the contract operator for the water system since 2006, with its contract most recently renewed in November 2019. NEWUS staff are responsible for the day-to-day operation of the water system and for ensuring that water quality meets state and federal drinking water standards. NEWUS is also responsible for providing 24-hour support to UConn personnel during water system emergencies. NEWUS staff include an assigned water system manager, water system backup manager, and a water system operator, with additional backup staff available.

- Mr. Brant Buhler is the water system manager and the chief operator. His responsibilities include:
    - Scheduling and supervising the water system operators;
    - Preparing regular management reports to UConn personnel;
    - Preparing and updating Standard Operating Procedures for all water system stations;
    - Preparing and implementing a Preventative Maintenance Program for all water system equipment;
    - Supervising purchasing of supplies and equipment;
    - Supervising the preparation of regulatory reports and Consumer Confidence Reports (CCRs);
    - Providing direction to UConn's on-site primary and/or backup managers to direct the water system staff in the operation of the water systems;
    - Acting as the primary contact for the media in regard to water system operational issues;
    - Performing system checks of the treatment and pumping stations;

Figure 2-1 Water System Management



- o Collecting Connecticut DPH required water quality samples and delivering the samples to a DPH-approved laboratory for analysis;
  - o Logging production and/or distribution meter readings;
  - o Monitoring equipment for signs of wear and identifying malfunctioning machinery;
  - o Maintaining appropriate station logs; and
  - o Monitoring the water treatment processes and providing batch treatment chemicals as needed.
- Mr. Tom Kearney is a certified operator and assists Mr. Buhler with field services related to water system maintenance, sampling, inspections, and other field work as listed above.
- Mr. Donnel Dillion is the backup water system manager for times when Mr. Buhler is not available.
- Mr. Don Schumacher is the superintendent of operations for NEWUS.

Additional certified water system operators are assigned from NEWUS as needed for on-site operation and maintenance of water systems on weekends, holidays, after-hours emergencies, and special tasks such as water line flushing and adjusting cross-connections. A Standby Schedule is available to UConn water system managers to ensure that NEWUS staff may be contacted at any time.

2.3 Operator Certification

Section 25-32-9 of the Connecticut Public Health Code (PHC) requires all regulated community water systems with treatment to employ at least one operator who is a certified treatment plant operator. Section 25-32-11 of the PHC requires a certified distribution system operator for regulated systems serving 1,000 or more people. A cross connection inspector and backflow prevention tester must be certified as well.

UConn has contracted the day-to-day operation of its water system to NEWUS who operates the water system consistent with Connecticut PHC requirements. NEWUS personnel who hold treatment plant operator, distribution system operator, and cross connection certifications, and are involved in the operation of UConn's water system, are listed on Table 2-1. Copies of individual certificates are included in Appendix A.

TABLE 2-1
Summary of State Certifications

Individual	Certification Type	Certification Number
Donald Schumacher	Class II Distribution System Operator	DWDO.195068-C2
Brant Buhler	Class III Distribution System Operator	DWDO.201083-C3
Thomas Kearney	Class I Distribution System Operator	DWDO.194019-C1
Donald Schumacher	Class II Water Treatment Plant Operator	DWPO.195129-C2
Brant Buhler	Class II Water Treatment Plant Operator	DWPO.196009-C2
Thomas Kearney	Class II Water Treatment Plant Operator	DWPO.204186-C2
Brant Buhler	Cross Connection Survey Inspector	DWCI.250092
Thomas Kearney	Cross Connection Survey Inspector	DWCI.250064
Brant Buhler	Backflow Prevention Tester	DWBT.204650
Thomas Kearney	Backflow Prevention Tester	DWBT.204406

2.4 Legal Authority and Contractual Agreements

The primary function of the UConn water supply system is to provide the UConn campus with an adequate water supply. State legislation was passed in 1949 authorizing UConn to supply water, sewer, garbage, and waste disposal services. That legislation was amended in 1967 via CGS Section 10-143 which was transferred to CGS Section 10a-138 in 1983. This statute reads that "*The University of Connecticut is authorized to furnish, for compensation, running water and sewage, garbage, and waste disposal service for any property owned or occupied by it or in which it has an interest by reason of a possibility or reverter or of a restriction on alienation in its favor.*"

A number of informal and formal commitments and agreements are in place for the UConn water system. These are described below:

- An agreement was reached in 1969 between MTS and UConn that transferred ownership of the Willimantic River Wellfield to UConn. This agreement provided UConn with the necessary infrastructure and potential well locations to service UConn in the 1970s. The agreement stipulated that UConn would serve MTS. A second agreement was reached in 1993 that transferred the ownership of lands and water system infrastructure held by MTS to UConn after MTS closed. Thus, the MTS campus became part of UConn and known as the Depot Campus. Some of the former MTS lands were transferred to the Connecticut Department of Corrections (DOC) and remained connected to the water system; these lands were later transferred to UConn following closure of the Bergin Correctional Facility in 2011. Homes on Old Colony Road and Spring Manor Lane remained on the system as well. These agreements document the formation of the current water system, but do not commemorate arrangements with separate water systems and/or municipalities; therefore, copies are not included in this *2020 Plan*.

- In the mid-1980s and then again in 2003-2004, UConn reached a series of agreements to serve residential properties on and near Hunting Lodge Road where owners were concerned about potential contamination of their private water supplies by the former UConn landfill. Legal agreements were believed to be in place for some of these commitments. Because these are agreements with individual customers (and are presently superseded by the agreement with CWC), copies are not included in this *2020 Plan*.

- In May 1989, UConn and the Town of Mansfield reached an agreement to provide water and sewer service to Town-owned properties on, and near, South Eagleville Road. The agreement specified which Town-owned properties were to be served by the UConn water system. This agreement is superseded by the December 2013 agreement between UConn and CWC and the January 2014 agreement between the Town of Mansfield and CWC such that a copy is not included in this *2020 Plan*.

- UConn contracted NEWUS to operate its water system in 2006. The water system management contract is regularly rebid, and NEWUS was awarded new contracts in 2010 and 2020. Copies of the operational contracts are maintained in UConn files and are not appended to this *2020 Plan*.

- In November 2006, UConn and Storrs Center Alliance, LLC reached an agreement whereby the UConn would supply up to 170,000 gpd of water to the Storrs Center development area. This agreement is superseded by the December 2013 agreement between UConn and CWC and the January 2014 agreement between the Town of Mansfield and CWC described below such that a copy is not included in this *2020 Plan*.

- As of 2011, UConn was committed to serving three areas of future development and corresponding water service. These were: (1) development in the North Campus area (part of the Main Campus); (2) future development at the Depot Campus; and (3) future development in the King Hill Road area adjacent to North Eagleville Road. Legal agreements were not in place for these three commitments. Subsequent to the December 2013 agreement described below, future development in North Campus may be served by either UConn or CWC depending upon the nature of the development; future development at the Depot Campus will likely be served by UConn; and future development along King Hill Road will be served by CWC.

The process for entering into a new agreement with UConn for water service was previously formalized by the 2006 "University of Connecticut Water System Rules and Regulations". However, in December 2013, UConn and CWC reached an agreement on a long-term water contract to supplement the water supply for the Storrs campus, including the UConn Technology Park, and parts of Mansfield. The agreement calls for CWC to provide UConn up to 1.5 million gallons of water daily as needed over a 50-year term. CWC will charge UConn a State-Owned Infrastructure Rate to reflect the state's ownership and continued operation of the UConn system. The agreement requires UConn to transfer to CWC all fully depreciated off-campus water distribution assets and to license to CWC, for their use, all off-campus water distribution assets, regardless of depreciated value, upon completion of the pipeline interconnection. A copy of this agreement is included in Appendix B. Thus, off-campus areas are now the responsibility of CWC, as established by the December 2013 agreement and the January 2014 agreement described below.

In January 2014, an agreement was reached between CWC and the Town of Mansfield which indicated CWC will serve customers in Mansfield, including the Four Corners area. CWC maintains rates at the existing UConn rate for off-campus customers in Mansfield who had formerly been on UConn's water system. The agreement states that new customers in Mansfield would pay regular residential or commercial rates in effect at the time of connection, as was previously authorized by the Public Utility Regulatory Authority (PURA). A copy of this agreement is included in Appendix B.

Note that if any party in Mansfield is interested in securing a commitment for future water supply from CWC, he or she must submit a request to the Water System Advisory Group (the successor to the Water and Wastewater Advisory Committee) for review and comment. Pertinent to UConn, this includes any potential new buildings on UConn land where the building would not be owned by UConn, such as potential public-private partnerships in the Technology Park. The Group includes UConn and CWC officials as well as representatives from the Town of Mansfield, Town of Coventry, Town of Tolland, and Town of Windham. These officials meet on a semi-annual basis or as needed to discuss growth and usage of the water system. Note that certain controls proscribed by the Record of Decision for the CWC interconnection have been implemented as part of the January 2014 agreement and the Town of Mansfield Zoning Regulations to prevent induced growth related to public water service provided by CWC.

Finally, UConn and CWC prepared a "Standard Operating Procedures" document to guide the operation and maintenance of CWC's off-campus water systems and operation of the CWC interconnection subject to the above agreements. A copy of this document is provided in Appendix B.

2.5 Financial Program

The water supply system that serves the Main Campus and the Depot Campus is owned by UConn. UConn is funded through operating and capital funds. Most of the recent major water system improvements have come through capital funding. The following is a brief overview of these capital funding programs:

- Public Act 95-230 was passed by the Connecticut General Assembly in 1995. More commonly known as the "UConn 2000" Act, this act became a ten-year, $1 billion program, with over 100 capital improvement projects completed.
- The success of the "UConn 2000" program led the Connecticut General Assembly to enact "21st Century UConn" legislation in 2003 that committed an additional $1.3 billion for continuation of the capital improvement projects began under the "UConn 2000" program.
- The NextGen Connecticut legislation (Public Act No. 13-233, 13-184, 14-47), extended the UConn 2000 program through Fiscal Year 2024, and added $1.6 billion in new bond authority.

In addition to these capital-funding initiatives, UConn also receives operating funds from the State of Connecticut. These funds come in the form of an annual block grant.

Prior to the completion of the CWC interconnection and the transfer of off-campus customers from UConn to CWC, UConn also received revenue from the sale of water to off-campus private and commercial customers. Currently, there is a very limited number of private, non-UConn customers from which UConn receives revenue because they continue to be served by the on-campus distribution system. These are described in Section 5.2.3.

UConn's water rate schedule since 1985 is shown in Table 2-2. A uniform meter charge is levied to all customers with meters to cover the cost of reading meters. Metered customers are also charged for actual consumption of water. Note that UConn's water rate schedule includes a flat consumption rate for single-family connections that are not metered. However, the remaining customers who are currently billed by UConn are metered, so the flat rate is not in use at this time.

TABLE 2-2
Summary of Water Rates

Year	Residential Single Family Unmetered	Metered Residential and Commercial		
		First 1,200 cf	Next 10,000 cf	Over 11,200 cf
1985-1986	$25.00	$25.00	$1.50/hcf	$1.00/hcf
1987-1988	$150.00	$25.00	$1.50/hcf	$1.00/hcf
1989	$160.00	$50.00	$1.75/hcf	$1.35/hcf
1990	$176.00	$55.00	$1.93/hcf	$1.48/hcf
1991	$185.00	$60.00	$2.03/hcf	$1.56/hcf
1992-1993	$185.00	$60.00	$2.03/hcf	$1.56/hcf
1994	$195.00	$63.00	$2.13/hcf	$1.64/hcf
1995	$225.00	$72.00	$2.45/hcf	$1.89/hcf
1996-1998	$270.00	$108.00	$2.54/hcf	$2.03/hcf
1999-2003	$300.00	$108.00	$2.54/hcf	$2.03/hcf
2003-2006	$315.00	$113.00	$2.54/hcf	$2.03/hcf
2006-present	$340.00	$3.05/hcf		

Notes: "cf" = cubic feet; "hcf" = hundreds of cubic feet.
UConn currently has a quarterly meter charge of $25.00 per quarter or $100 annually.

As many of the former off-campus customers served by the UConn water system were also sewer customers, the accounting system used to track revenues does not easily breakdown water revenue as opposed to sewer revenue. The amount of revenue collected for water and sewer service from private and commercial users for each year since 1999 is shown in Table 2-3. Note the significant drop-off in residential revenue that began in 2018 once the water customers were fully transferred to CWC billing.

TABLE 2-3
Water & Sewer Annual Revenues

Year	Single Family Residential	Commercial Accounts	Total
1999	$47,750	$201,336	$249,086
2000	$54,030	$284,295	$338,325
2001	$54,150	$175,959	$230,109
2002	$54,900	$302,356	$357,256
2003	$80,175	$412,572	$492,747
2004	$27,075	$576,736	$603,811
2005	$56,382	$473,601	$529,983
2006	$57,638	$458,193	$515,831
2007	$96,684	$443,050	$539,734
2008	$92,700	$490,836	$583,536
2009	$101,983	$747,907	$849,890
2010	$36,035	$665,963	$701,999
2011	$71,314	$570,721	$642,035
2012	$62,096	$624,851	$686,946
2013	$77,808	$633,409	$711,217
2014	$163,193	$670,913	$834,106
2015	$135,195	$305,041	$440,236
2016	$169,735	$273,615	$443,351
2017	$154,963	$224,453	$379,416
2018	$45,364	$80,918	$126,282
2019	$21,457	$322,625	$344,082

Past revenues from the sale of water are not indicative of what future revenues are expected to be now that the CWC interconnection is complete and most off-campus customers have been transferred to CWC. The income from the charges made to off-campus users would not support a water company with a system the size of UConn's. This revenue is not considered to be a significant source of income. State funding remains the primary source of income for the UConn water supply system. The total operating cost of the UConn water system is spread over several departments such that it is difficult to differentiate water system operating funds from other operating funds within each departmental budget.

UConn has made several financial commitments to the maintenance and improvement of its water supply system since 2011 totaling over $14.6 million dollars. The following is a list of projects that included water supply system repairs and upgrades.

TABLE 2-4
Recent Water Supply System Upgrades and Initiatives (2011-2019)

Description	Cost
NEWUS Operation and Management contract ($523,384 per year)	$4,710,456
USGS Streamflow gauge operation ($37,800 per year)	$340,200
Willimantic Well 1 inspection, redevelopment, and pump repair	$67,311
Willimantic Well 2 inspection, redevelopment, and pump repair	$45,176
Willimantic Well 3 inspection, redevelopment, and pump repair	$72,105
Willimantic Well 4 inspection, redevelopment, and pump repair	$54,177
Fenton Tank Clearwell repairs	$12,025
Water Utility Atlas update	$76,828
Willimantic Well building upgrades	$95,756
High Head/Towers Booster building upgrade	$77,555
Meter Pit claval replacement	$5,603
Metering update	$116,665
Insertion valves	$128,540
Repair 100 HP 2750 gpm centrifugal pump at 5.4 MG tank	$43,213
Replace 100 HP pump #2 at High Head pump station	$43,807
Replace 100 HP pump #3 at High Head pump station	$43,807
Pressure wash tanks	$7,803
Clayton Valves - 12	$49,017
Main Water Line Repair and Replacement	$3,750,000
Main Water Line Replacement Phase 2 & CWC interconnection Meter Pit and on-campus segment	$3,492,438
Willimantic Treatment Building – pipe and tank repairs	$46,367
High Head Generator upgrade project	$878,900
EIE for Supplemental Water Supply	$295,510
GWUDI Study for Fenton Well D	$47,200
Low Flow Study of Fenton Well D	$19,190
Water Supply Plan Update Assistance	$41,200
American Water Infrastructure Act Emergency Response Planning	$40,000
Total Upgrades and Initiatives Since 2011	**$14,600,849**

2.6 Water Utility Assets

The assets of the UConn water supply system consist of the following major components:

- Fenton River Wellfield
  - Wells A, B, C, and D
  - Pump house/Lift Station
  - Fenton Wellfield Chemical Facility
  - Underground clearwell basin at Fenton River Wellfield

- Willimantic River Wellfield
  - Wells #1, #2, #3, and #4
  - Willimantic River Wellfield Chemical Facility

- Transmission Mains
  - Willimantic River Wellfield to Depot Campus
  - Willimantic River Wellfield to Main Campus
  - Fenton River Wellfield to Main Campus
  - High Head Reservoir to Towers Standpipes

- Storage
  - W-Lot Reservoir and High Head/Towers Loop Pumping Station
  - Towers Standpipes
  - Depot Campus storage tanks

- Distribution Mains
  - Main and branch lines, valves, and hydrants for the distribution of water to the buildings and facilities of UConn.

Note that main and branch lines, valves, and hydrants for the distribution of water to non-UConn buildings which have not fully depreciated and have not been transferred to CWC, are still owned by UConn. However, CWC is responsible for the operation and maintenance of such off-campus infrastructure. Therefore, for the purposes of this *2020 Plan*, such off-campus infrastructure is considered to be under the control of CWC and is not included in the figures herein.

The replacement cost for the UConn water system, excluding land, was estimated at $26 million in the 1999 *Water Supply Plan*. A 2006 infrastructure report[5] prepared for UConn in September 2006 indicated facility replacement cost of the water system at approximately $23.5 million. This cost is believed to cover all infrastructure, including mains, pumps, and storage tanks in place at that time.

The 2007 *Water and Wastewater Master Plan* provided more in-depth estimates of the value of water system components. The overall replacement costs presented in that document are outlined in Table 2-5. The costs in Table 2-5 are valued in 2007 dollars. Note that the value of the off-campus water mains was estimated at approximately $10.3 million at that time.

[5] ISES, 2006, "Potable Water and Fire Protection Systems Infrastructure Condition Analysis", University of Connecticut.

TABLE 2-5
Probable System Replacement Costs (2007 Dollars)

Item	Cost
Wellfield Replacement	$6,200,000
Pump and Emergency Generator Replacement	$1,236,100
Treatment and Storage Facilities	$12,025,000
On-Campus Water Mains	$7,330,245
Total	**$26,791,345**

While Table 2-5 includes a replacement cost for the two UConn wellfields, it is important to note that these wellfields are invaluable given the current regulatory environment. It is uncertain that permits for similar supply sources and volumes could be obtained in the same, or similar, locations in the future.

2.7 University-Controlled Land

UConn includes two primary campus areas in Mansfield. The Main Campus is located off Route 195 in Storrs, and the Depot Campus is located near the intersection of Route 44 and Route 32 in Mansfield.

The Main Campus was established in 1881 with a gift of land and money from Charles and Augustus Storrs. Additional land was granted by the State of Connecticut in 1893 when the institution became Connecticut's land grant college[6]. Over the years, UConn has expanded through the purchases of additional land surrounding the initial grants, as well as gaining control of land no longer needed by other state agencies.

The Depot Campus consists of land that was originally part of the now defunct MTS, which had been managed by the State Department of Mental Retardation. This State-owned facility opened in 1917 with the merger of the Connecticut Colony for Epileptics (opened at the MTS site in 1910) and the Connecticut Training School for the Feebleminded (originally opened in Lakeville, CT in 1860)[7]. In May 1969, an agreement was reached between numerous State agencies that perpetually granted UConn exclusive use of MTS land, buildings, and equipment on four parcels of land associated with the MTS farm operation. This included water infrastructure such as the Willimantic River Wellfield, piping, pumping stations, and water storage tanks.

The MTS facility was gradually phased out and finally closed in July 1993. The State Legislature transferred the remaining MTS property to UConn under Public Act 93-80. In November 1993, a special Memorandum of Understanding was signed between the State Department of Public Works, UConn, the Department of Mental Retardation, and the Office of Policy and Management regarding the transfer. This document transferred a portion of the MTS property north of Route 44 to the Connecticut DOC that was formerly known as Bergin

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[6] Wikipedia, 2010, "University of Connecticut – History", http://en.wikipedia.org/wiki/University_of_Connecticut, Last Accessed October 27, 2010.
[7] Wikipedia, 2010, "Mansfield Training School and Hospital", http://en.wikipedia.org/wiki/Mansfield_Training_School_and_Hospital, Last accessed October 27, 2010.

Correctional Institution. UConn acquired the remaining property and all water system infrastructure. In 2015, the portion of the former MTS property that had been in the custody of DOC was transferred to UConn.

In total, state land in the custody and control of UConn consists of approximately 3,230 acres in Mansfield. Approximately 707 acres (22%) of this land is associated with the Depot Campus. Much of the land owned by UConn is undeveloped. Parcels under the control of UConn are presented in Table 2-6, which also indicates properties that contain water supply system assets described in this *2020 Plan*. Figure 2-2 is a map of Mansfield showing UConn-controlled land listed in Table 2-6.

TABLE 2-6
UConn-Controlled Land in Mansfield

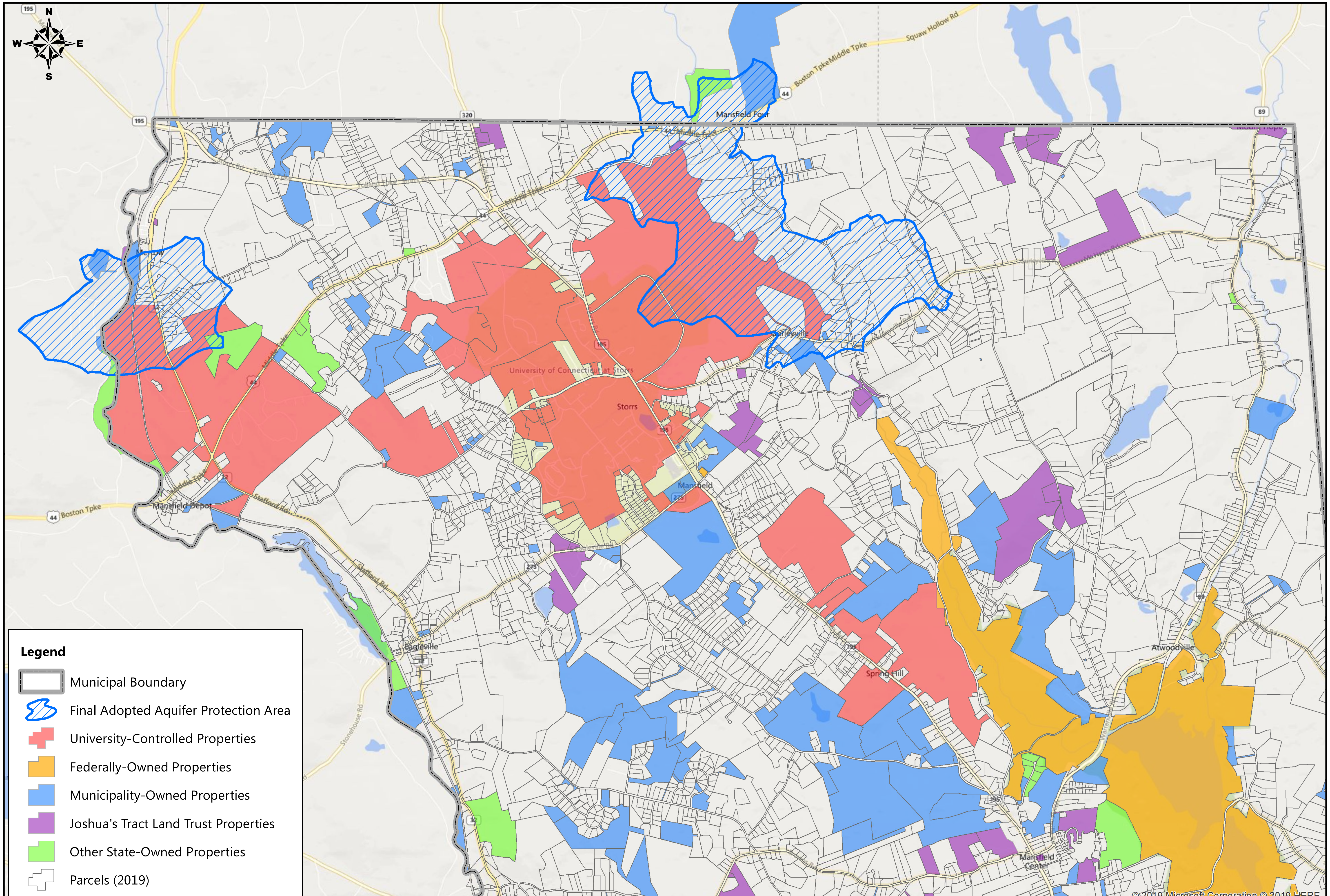
Map.Block.Lot	Location	Comment	Acres	Includes or is Served by Water System Assets
13.13.1	251 Middle Turnpike	Bergin Correctional Facility, Depot Campus	181.50	Yes
13.17.1	Middle Turnpike	Agriculture	5.09	No
14.18.DC2128	1279 Stafford Road	Multi-family residence	5.33	No
14.18.DC2187	30 Plains Rd	Plains Road Sewer Lift Sta.	10.85	No
14.18.19	Middle Turnpike	Depot Campus	233.64	Yes
14.21.2	Northwood Rd	Includes Northwood Apartments west of Northwood Road	139.47	No
14.28.5	Bonemill Road	Pink Ravine Lab / Old Treatment Plant	0.36	No
15.21.UC1036	Northwood Rd	Northwood Apartments east of Northwood Road	6.34	No
15.32.1	29 King Hill Road	Vacant	0.49	No
15.32.15	Storrs Rd / N Eagleville Rd	Main Campus	371.64	Yes
15.32.18-1	Separatist Rd	Vacant	7.90	No
15.32.2	29 King Hill Road	Largely vacant, some parking	12.44	No
15.32.3	King Hill Road	Lot L Parking	4.08	No
15.32.4	17 King Hill Road	Lot X Parking	5.18	No
15.32.5	Hunting Lodge Road	Vacant	8.43	No
15.32.UC1098	1595 Storrs Road	Northern Discovery Drive - Vacant	77.33	Yes
15.33.2	King Hill Road	Vacant	0.91	No
15.33.6	16 King Hill Road	Ted's	0.18	No
16.32.UC314	1 Hillside Road	Single family residence	0.85	No
16.36.UC227	14 Eastwood Rd	Single family residence	0.46	No
16.36.UC424	25 Hillside Circle	Single family residence	1.51	No
16.38.1	Storrs Rd / Gurleyville Rd	Holcomb, Whitney, Sprague Halls	14.50	Yes
16.38.UC243	75 Willowbrook Rd	Single family residence	4.94	No
16.39.UC219	10 Willowbrook Rd	Single family residence	5.39	Yes
16.40.10	9 Oak Hill Road	Buckley & Shippee Halls	10.06	Yes

TABLE 2-6
UConn-Controlled Land in Mansfield

Map.Block.Lot	Location	Comment	Acres	Includes or is Served by Water System Assets
16.40.10-B	1 Dog Lane	Storrs Center	2.14	No
16.57.UC179	1 South Eagleville Rd	Mansfield Apartments	16.80	No
16.62.6	Agronomy Rd	Plant Science Research & Education Facility	156.64	No
23.60.18	Storrs Road	Agronomy Research Farm	62.56	No
23.63.UC1011	950 Storrs Rd	Agronomy Research Farm	41.04	No
23.63.UC1050	986 Storrs Rd	Agronomy Research Farm	21.41	No
23.63.UC1088	968 Storrs Rd	Agronomy Research Farm	9.70	No
23.64.7	Storrs Rd / Chaffeeville Rd	UConn Research Forest	208.13	No
3.25.10	Gurleyville Rd / Old Turnpike Rd	UConn Forest / Horsebarn Hill Facilities / Fenton Wellfield	712.47	Yes
7.12.5	Spring Manor Ln	Spring Manor Farm	156.26	Yes
7.12.6	Spring Manor Ln	Spring Manor Farm / Willimantic River Wellfield	114.19	Yes
8.23.1-4	Discovery Drive	Vacant	3.93	No
8.23.11	Storrs Rd / N Hillside Rd	Technology Park / Charter Oak Apartments	207.64	Yes
8.23.16	Hunting Lodge Road	Hillside Environmental Education Park	63.46	Yes
8.23.16-1	1 Penner Place	Celeron Square Apartments	19.33	No
8.23.16-2	Hunting Lodge Road	Vacant	17.43	No
8.23.2-3	Discovery Drive	Vacant	3.53	No
9.23.15	Storrs Rd	W-lot, Husky Village, Towers, Floriculture	57.14	Yes
9.23.23	46 North Eagleville Road	Saint Thomas Aquinas Chapel	2.07	Yes
9.23.27	North Eagleville Road / North Hillside Road	North and Northwest Residence Halls, Facilities, Water Pollution Control Facility	84.28	Yes
9.24.UC1092	1590 Storrs Rd	Single family residence	3.02	No
9.25.1	Storrs Rd	Horsebarn Hill, East Campus	163.20	Yes
		Total	**3,235.24**	-

UConn also maintains several easements related to former off-campus portions of its water systems that cross private property. These easements are related to water mains that are currently under the control of CWC and are listed below:

- Multiple sections of the 8-inch water main along Route 32 from Spring Manor Lane to Depot Road area;
- Mains serving Mansfield Apartments on South Eagleville Road; and
- A portion of the 10-inch main serving Northwood Apartments near North Eagleville Road.



Sources:
-Land ownership defined within Mansfield and within Level A Aquifer Protection Areas in Coventry and Willington. Ownership of parcels based on best-available data from UConn and online assessors' databases through August 2019. Delineations may not be exact.
-Base map provided by Microsoft via ESRI subscription service.
-Aquifer Protection Areas courtesy of CT DEEP.

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REVISIONS
8/29/2019

University, State, Federal, Municipality-Owned, and Land Trust Lands

University of Connecticut Water Supply Plan

Storrs, Connecticut

SJB DESIGNED | EA DRAWN | SJB CHECKED

SCALE: 1" = 3000'

DATE: 5/5/2011 (Orig.)

PROJECT NO: 1958-119

MXD NAME: Y:\Figure2-2.MXD

FIGURE 2-2

SHEET NO.

3.0 EXISTING WATER SUPPLY SYSTEM

3.1 Overall System Description

The UConn water system was originally installed to provide potable water just to the Main Campus, but was expanded, through a variety of contractual agreements, to provide water to the Depot Campus as well as select off-campus users. As of December 2016 (when the CWC interconnection was permanently activated), commercial, institutional, and residential properties in the Town of Mansfield that are not owned by UConn, as well as certain UConn facilities away from the campus core, began to receive service from CWC. Thus, the water system currently serves all on-campus buildings, residence halls, and apartments at both the Main and Depot Campuses, as well as a handful of remaining off-campus customers.

The ADD for UConn properties in 2019 was 1.05 mgd, of which 0.72 mgd was drawn as potable water from the two UConn wellfields, and 0.33 mgd was generated for non-potable use by the RWF. No water was purchased from the CWC interconnection. PDD in 2019 was approximately 2.05 mgd, occurring in the month of September, including both potable water and RWF flows. Section 5.0 of this *2020 Plan* provides a more detailed overview of system demands.

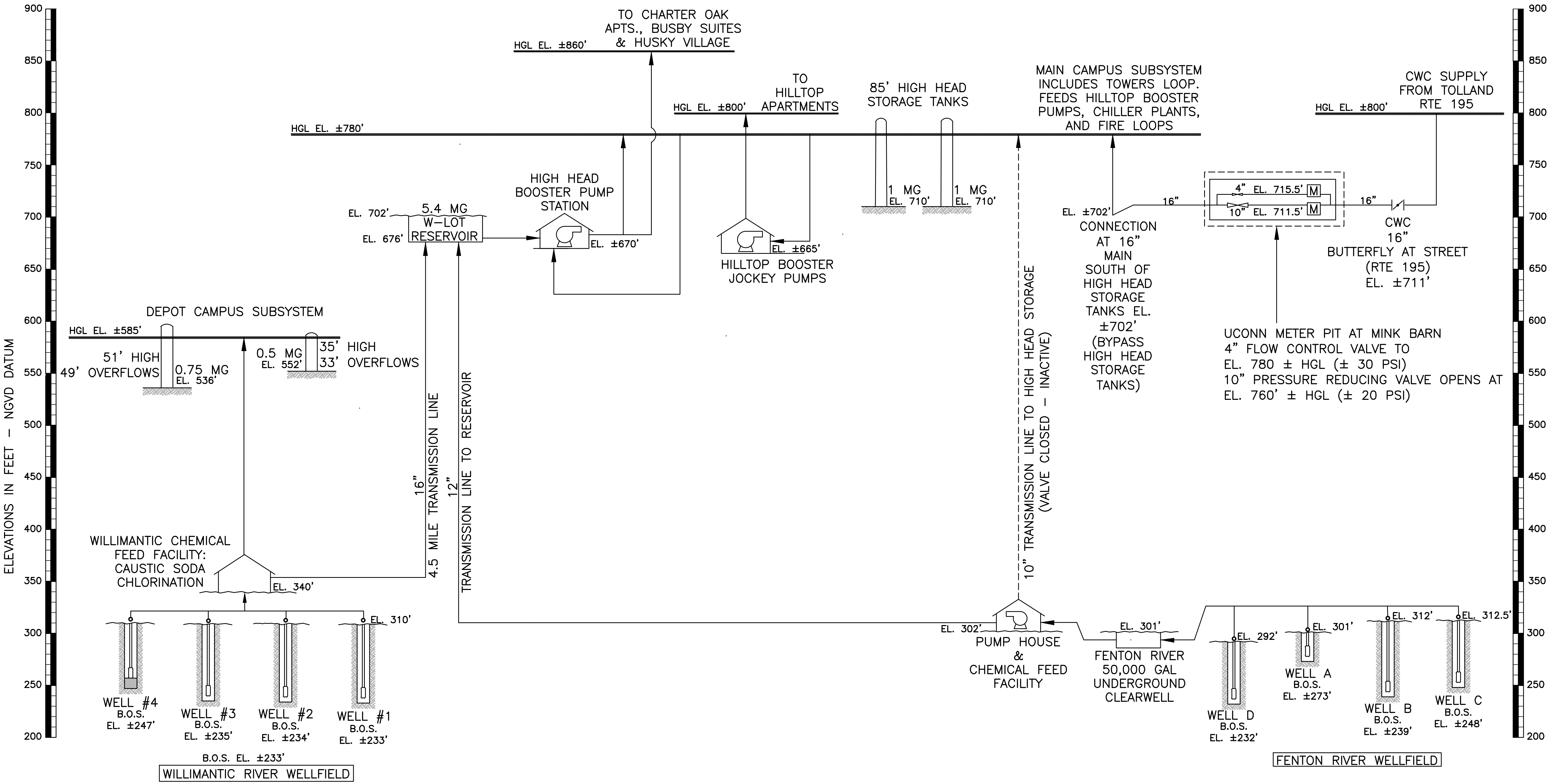
The UConn water system includes seven wells, 6 potable water storage tanks, and approximately 31 miles of water transmission and distribution mains. The system also includes a dedicated fire loop, 146 hydrants, two treatment facilities (one for each wellfield), and numerous transfer pumps located at four pumping stations. Appended Figure 1 depicts major system components. Figure 3-1 is a schematic diagram of the water supply system. Ground water sources are discussed in detail in the ensuing text. Other system components are discussed in Section 4.0 of this *2020 Plan*.

As UConn is a state-wide entity, it operates facilities in other locations that are served by other water systems as well as one smaller public water system that is summarized below.

- UConn Avery Point (Groton): Groton Utilities
- UConn Hartford: Metropolitan District Commission
- UConn Health Center (Farmington): Metropolitan District Commission
- UConn School of Law (Hartford): Metropolitan District Commission
- UConn Stamford: Aquarion Water Company
- UConn Waterbury: City of Waterbury Water Department

UConn formerly operated a Torrington regional campus, but that property was sold in 2019, and UConn no longer operates or maintains a public water system in Torrington. When UConn was operating the Torrington regional campus water supply system, it was classified as a Non-Transient, Non-Community Water System (public water system #CT1435053) by the Connecticut DPH, and the system served approximately 400 commuting students and 40 faculty. The new owner of the Torrington campus property is now responsible for the water supply wells that serve that property. Note that UConn currently leases one building on the Torrington property that is occupied by one of the UConn agricultural extension programs, with water provided by agreement with the new owner.

UConn also has a potable water supply system at the Agronomy Farm in Mansfield located along Route 195 to the south of the Main Campus. However, this water system does not meet the threshold for a public water supply and further discussion of that system is not included herein.



NOTES:
1. DIAGRAM IS FOR SCHEMATIC PURPOSES ONLY. BUILDINGS, TANKS, PUMPS AND DISTANCE BETWEEN STRUCTURES NOT TO SCALE.
2. B.O.S.: BOTTOM OF SCREEN

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SCHEMATIC DIAGRAM
UNIVERSITY OF CONNECTICUT
WATER SUPPLY PLAN
STORRS CAMPUS
MANSFIELD, CONNECTICUT

SJB	CME	SJB
DESIGNED	DRAWN	CHECKED

SCALE: NTS
DATE: DECEMBER 2019
PROJECT NO.: 1958-119-04

SHEET NO.: FIG. 3-1

Note that for the purposes of this document, the term "water system" refers to the water system of the Main Campus and the Depot Campus in Storrs and Mansfield and not to public water service providers at any of the regional campus systems, or to the small non-public well system at the Agronomy Farm.

3.2 Water Supply Sources

UConn utilizes seven active wells located at two wellfields as the primary source of water for the Main Campus and Depot Campus. Additional potable water is provided by the CWC interconnection, and non-potable water (to offset potable water demands) is provided by the RWF. Four of the UConn wells (three active, one emergency) are located in the stratified drift aquifer beneath the Fenton River (drainage basin #3207), a tributary to the Natchaug River. The remaining five UConn wells (four active, one inactive) are located in the stratified drift aquifer beneath the Willimantic River (drainage basin #3100), a tributary to the Shetucket River.

3.2.1 Fenton River Wellfield

The Fenton River Wellfield consists of three active wells (Well B, Well C, and Well D) and one emergency well (Well A) located along the Fenton River north of Gurleyville Road in Mansfield, Connecticut. Figure 3-2 is a location plan of the Fenton River Wellfield. Well specifications are summarized in Table 3-1. During calendar year 2019 the Fenton River Wellfield provided 58% of the water used by the UConn water system, a greater percentage than the 20% historically produced (see Section 5.3 for more details).

TABLE 3-1
Fenton River Wellfield Specifications

Specification	Well A	Well B	Well C	Well D
Year Drilled	1926	1949	1949	1957
Type	Caisson	Gravel Packed	Gravel Packed	Gravel Packed
Depth	28 feet	70 feet	60 feet	58.5 feet
Diameter	24 feet	18-inch x 8-inch	18-inch x 8-inch	10-inch x 8-inch
Well Safe Yield	400 gpm[1]	838.4 gpm[2]	718.6 gpm[2]	450.2 gpm[2]
Screen Details	18.0-28.0 feet, caisson	52.0-70.0 feet, 0.090-slot	42.0-60.0 feet, 0.090-slot	43.0-58.5 feet, 0.045-slot
Pump Setting	28.0 feet	48.2 feet	39.2 feet	43.5 feet
Pump Type	5 HP LST[3]	10 HP LST	10 HP LST	25 HP LST
Design Pump Capacity	400 gpm @ 38' TDH[3]	400 gpm @ 45' TDH	400 gpm @ 40' TDH	354 gpm @ 66' TDH
Status	Emergency	Active	Active	Active

Notes:
1. Estimated during pumping test in the 1940s as discussed in 2004 *Water Supply Plan*. This yield test may not have met current safe yield guidelines.
2. Determined by UConn *Safe Yield Study* dated March 2020.
3. LST = Line Shaft Turbine; TDH = Total Dynamic Head

Date Saved: 5/10/2020

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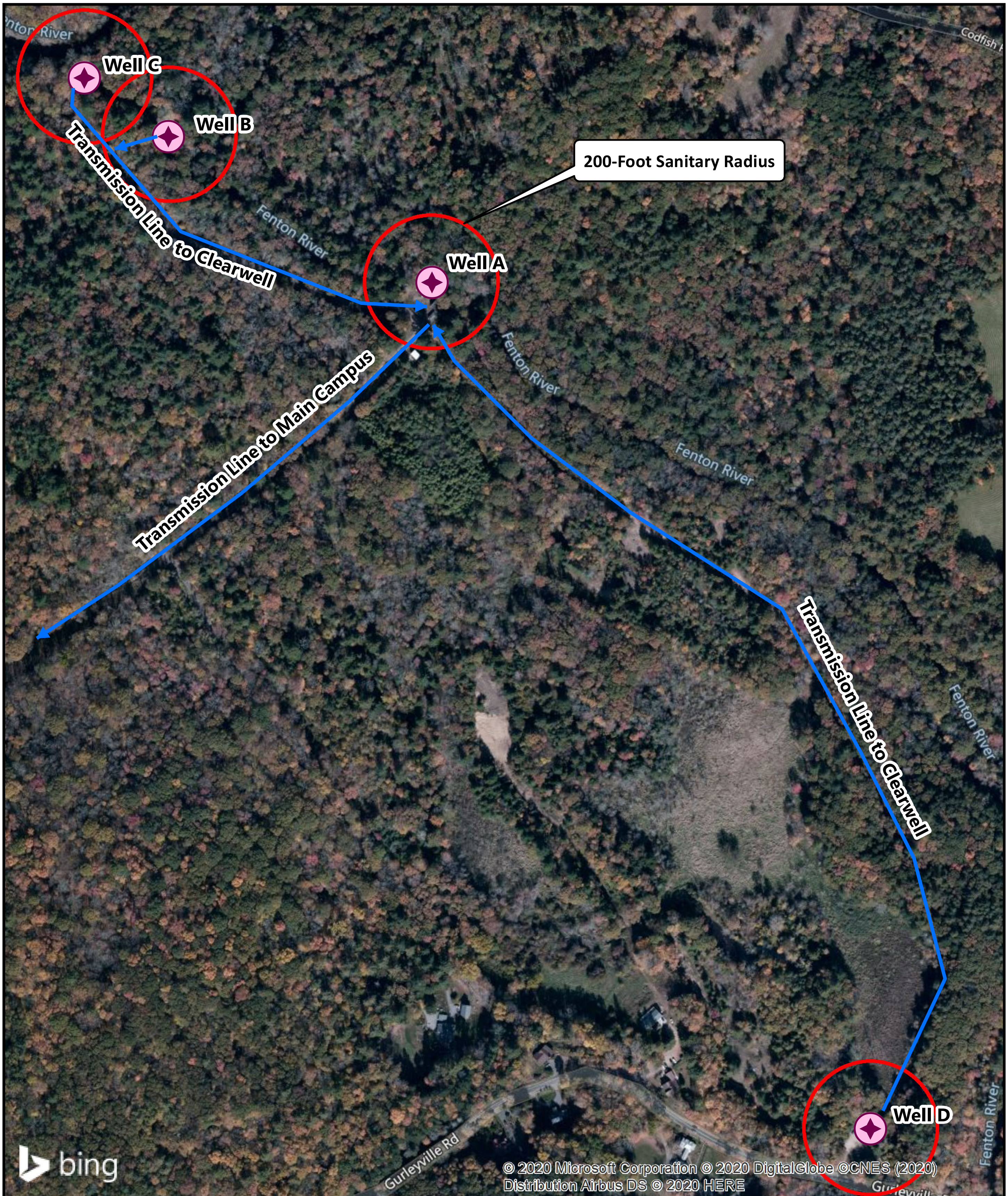

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FENTON RIVER WELLFIELD

WATER SUPPLY PLAN
UNIVERSITY OF CONNECTICUT

GURLEYVILLE ROAD
MANSFIELD, CT

N

0 400
Feet

SCALE	1 " = 400 '
DATE	5/10/2020
PROJ. NO.	1958-119

FIG. 3-2

Well A was the first well developed in the Fenton River Wellfield. It was drilled in 1926 by UConn to replace the Pink Ravine surface water supply which was owned by the Town of Mansfield at that time. Well A (with two pumps installed) was likely UConn's sole source of water supply until Wells B and C were developed in 1949. Well D was added in 1959 to provide an additional water supply source to the UConn system. Well A is presently an emergency well and is physically disconnected from the system to avoid accidental usage.

Water from the four Fenton wells is directed into a 50,000-gallon clearwell (underground tank) located near Well A. Water leaving the clearwell is treated with sodium hypochlorite (chlorine) for disinfection and sodium hydroxide (25% caustic soda) for pH adjustment and corrosion control after it passes the flow meter. The treatment system for the Fenton River Wellfield is located on the pump house road. The treatment building was constructed in 1993. The chemical dosages are paced to flow from a 4-20 milliamp signal. An automatic chlorine residual analyzer continuously measures and records the chlorine residuals.

Water in the clearwell is typically transferred to the Main Campus pressure zone by two booster pumps rated at 550 gpm and 1,000 gpm. This water is directed to the 5.4 MG underground reservoir at W-Lot where it mixes with finished water from the Willimantic River Wellfield. Alternatively, the transmission main from the Fenton clearwell can also direct water into the two 1.0 MG water storage tanks near the Towers Residence Halls, although this valve is typically closed.

Activation of the wellfield is normally dictated by a timer schedule or by the water level within the 50,000-gallon clearwell. Currently the wells are on a "first start – second start" system. Wells B and C are "first start" and Well D is the "second start." Alarm, status, and initiation signals (on/off) are transmitted to the existing UConn Supervisory Control And Data Acquisition (SCADA) system using the existing remote telemetry system located at the facility. Well A is reserved for emergency use at the present time but can be added to the operational schedule as needed upon completion of any necessary potability testing prior to reactivation. The pumps that transfer the water from the clearwell to the campus operate on a timer.

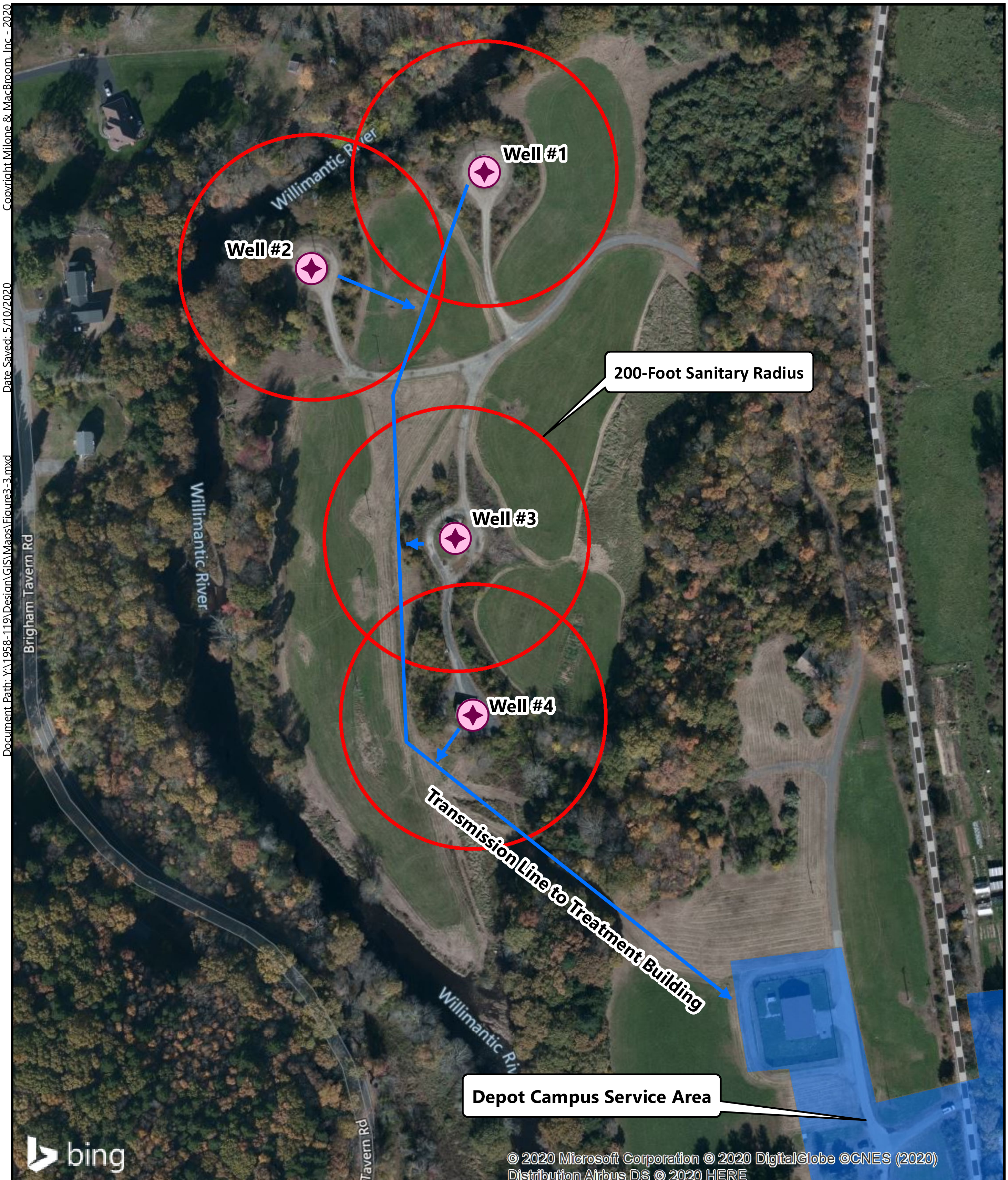
A 400-kilowatt (kW) diesel powered generator provides emergency power to the majority of the Fenton River Wellfield, including power to Wells A, B, C and D, the high lift pumps, the chemical feed pumps, and lighting.

3.2.2 Willimantic River Wellfield

The Willimantic River Wellfield consists of four active wells (Well #1, Well #2, Well #3, and Well #4) and one inactive well (MTS Well #2) located along the Willimantic River west of Spring Manor Farm (and Route 32) and north of Route 44 in Mansfield, Connecticut. Figure 3-3 is a location plan of the Willimantic River Wellfield.

Each well has an above-grade pump house that protects the well and houses a vertical turbine pump and motor, motor drive, valves, and ancillary equipment. Well specifications are provided in Table 3-2. Each well has variable frequency drive (VFD) controls. In 2019, the Willimantic River Wellfield provided 42% of the water used by UConn, which is atypical but partially due to ongoing well redevelopment activities at the wellfield.

The first well utilized at the Willimantic River Wellfield was installed around 1913 for MTS. It was a 24-foot diameter, 16.5-foot deep dug well. This well (known as MTS Well #1) had insufficient yield to supply MTS in the 1940s and was supplemented by MTS Well #2. MTS Well #1 was taken offline in 1961 after the activation of MTS Well #3 (now Well #3). MTS Well #1 was formally abandoned in 1998; its pump house was dismantled, and the well cavity was filled per Connecticut DPH well abandonment guidelines.



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WILLIMANTIC RIVER WELLFIELD

WATER SUPPLY PLAN
UNIVERSITY OF CONNECTICUT
SPRING MANOR LANE
MANSFIELD, CT

N

0 200
Feet

SCALE	1 " = 200 '
DATE	5/10/2020
PROJ. NO.	1958-119

FIG. 3-2

TABLE 3-2
Willimantic River Wellfield Specifications

Specification	Well #1	Well #2	Well #3	Well #4	MTS Well #2
Year Drilled	1970	1974	1958	1998	1948
Type	Gravel Packed	Gravel Packed	Gravel Packed	Gravel Packed	Gravel Packed
Depth	77 feet	78 feet	80.3 feet	65 feet[3]	60 feet
Diameter	30-inch x 16-inch	24-inch x 14-inch	24-inch x 8-inch	20-inch x 12-inch	12-inch
Well Safe Yield	559.7 gpm[1]	280.3 gpm[1]	550.3 gpm[1]	624.8 gpm[1]	525 gpm[2]
Screen Details	56.5-77.0 feet, 0.065-slot	68.3-78.0 feet, 0.100-slot	58.8-80.3 feet, 0.045-slot	43.0-58.0 feet, 0.080-slot	N/A
Pump Setting	71.1 feet	58.8 feet	71.2 feet	56.3 feet	N/A
Pump Type	100 HP LST	30 HP SUB[4]	100 HP LST	100 HP LST	N/A
Design Pump Capacity	400 gpm @ 555' TDH	210 gpm @ 420' TDH	600 gpm @ 500' TDH	540 gpm @ 484' TDH	N/A
Status	Active	Active	Active	Active	Inactive

Notes:
1. As calculated in *Safe Yield Study* dated March 2020.
2. As reported in *Hydrogeologic Data for the Shetucket River Basin* (1967)[8].
3. The bottom 7 feet of Well #4 is a sump and not screened as it has a lower hydraulic conductivity.
4. SUB = Submersible pump

MTS Well #2 was the first gravel-packed well developed at the Willimantic River Wellfield. It was drilled in 1948 to supplement MTS Well #1. Well #3 (formerly MTS Well #3) was constructed in 1958 to replace MTS Well #1. It was around this time that the residential population (and water demand) of MTS was reportedly reaching its peak.

Similarly, the UConn water system (at the Main Campus) was experiencing increased demand in the 1960s, and UConn began looking for additional sources of water to supplement the Fenton River Wellfield. In 1969, UConn and MTS reached an agreement where MTS transferred the Willimantic River Wellfield to UConn, and in return the UConn would provide potable water to MTS. MTS retained MTS Well #2 as a backup well, and UConn renamed MTS Well #3 to Well #3.

UConn commissioned several hydrogeologic studies in the late 1960s that suggested the Willimantic River Wellfield could support a total of six wells in addition to maintaining MTS Well #2 as a backup well. Only two of the four proposed wells were actually drilled: Well #1 was drilled in 1970 and Well #2 was drilled in 1974. MTS Well #2 was transferred to the UConn in 1993 after the closure of MTS, and UConn installed Well #4 in 1998 to replace the function of MTS Well #2. MTS Well #2 lies within the Well #4 pumphouse structure and is currently inactive; it is disconnected from the system and is only used as a water level monitoring point when necessary. UConn has no intention of formally abandoning MTS Well #2 at this time.

Water from the four Willimantic wells is directed to the chemical feed building near the railroad crossing at the western terminus of Spring Manor Lane. The building consists of a 65-foot by 45-foot concrete structure built in

[8] https://pubs.usgs.gov/ctwrb/0012/report.pdf

2010. Treatment includes the addition of sodium hypochlorite (chlorine) for disinfection and sodium hydroxide (25% caustic soda) for pH adjustment and corrosion control.

Each chemical feed system consists of one bulk tank and one day tank, two chemical metering pumps (one active and one spare) and associated chemical appurtenances. The chemical feed system is flow paced, using an on-site raw water magnetic flow meter. Alarm, status, and initiation signals (on/off) are transmitted to the existing UConn SCADA system using the existing remote telemetry system located at the facility. The treatment system can deliver a maximum capacity of 2.3 mgd of treated water. An automatic chlorine residual analyzer continuously measures and records chlorine residuals. Refer to Section 4.1 for more information about treatment.

After leaving the chemical feed building, flow is directed into the 16-inch diameter transmission main running to the Main Campus, or to the transmission main running to the Depot Campus. The transmission split occurs inside the building. Both transmission mains were replaced in their entirety in 2015-2016. The 16-inch diameter transmission main to the Main Campus delivers water to the W-Lot 5.4 MG reservoir.

A transformer pad at the chemical feed building provides a step down from the existing 13.8 kilovolt (kV) service to 480-volt (V) service for the wellfield. The chemical feed facility also houses a 600 kW generator to provide emergency power to the chemical feed equipment and the four well pumps. Normal and emergency 480 V service is provided through an underground electrical distribution system.

3.2.3 Reclaimed Water Facility

Consideration for treating wastewater for reuse on the Main Campus dates back to the early 2000s. The 2004 Campus Sustainable Design guidelines developed for UConn proposed several water reuse strategies, including the potential for treating water for reuse. Coincident with the completion of the Fenton River Study in 2006, the infrastructure conditions assessment performed for UConn that same year recommended an expansion of the UConn Water Pollution Control Facility (WPCF) to include a new wastewater treatment system capable of providing up to 0.5 mgd of treated effluent for reuse on campus. While the capacity of the two wellfields were adequate for typical demand, there was a concern that the capacity of the Fenton River Wellfield would be reduced, or unavailable, during prolonged periods due to low streamflow conditions.

The RWF project was therefore recommended as a means for reducing the demand for water from the Fenton River Wellfield and reducing the overall impact of the wastewater discharge to the Willimantic River. UConn began to further explore this approach in the 2007 *Water and Wastewater Master Plan*[9], culminating in a study completed by the firm Hazen & Sawyer in 2008 which indicated that the use of treated wastewater at the CUP was feasible.

Campus water demand is typically at its highest in September when the students return for fall semester classes; this highest-demand time period often coincides with low stream flow in the Willimantic and Fenton Rivers. Water demands are typically lowest in May when the students leave campus and the summer cooling load at the CUP is not at its peak. Peak demands at the CUP typically occur in the summer months due to increased cooling demands.

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[9] https://envpolicy.uconn.edu/wp-content/uploads/sites/1389/2015/08/FINAL-UConn-Water-and-Waste-Water-Master-Plan.pdf

The CUP utilizes water in its boilers, chilled water systems and cooling towers. Prior to construction of the RWF, potable water was used to fulfill all CUP demands. Water for the boiler system is softened and demineralized via reverse osmosis (RO). Water for the cooling towers and chilled water system is treated for scale, corrosion, and biological growth control. The annual average water consumption for the CUP is 0.25 mgd but consumption can peak as high as 0.45 mgd. Boiler makeup water demand peaks in the winter months, while cooling tower makeup water demand, which is considerably higher than boiler makeup water demand, peaks in the summer. The summer peak season runs from late June to early September and coincides with the lower seasonal flows at the WPCF.

The 2008 feasibility study was referenced in the 2011 *Water Supply Plan*, which noted that the CUP requires an average flow of 0.4 mgd during peak months that could be replaced by non-potable water. Based on the analysis in the 2011 *Water Supply Plan*, it became evident that constructing a RWF could be implemented quickly to reduce wellfield withdrawals and improve system margin of safety. Thus, the short-term intent of the RWF was to generate non-potable water for use at the CUP, thereby freeing up potable water that would otherwise be used at the CUP. Additional uses for the reclaimed water, such as irrigation and toilet water flushing, were also envisioned. As such, a facility with a larger treatment capacity was ultimately designed (capacity of 1 mgd).

In 2013, the RWF was brought online. The WPCF receives sanitary wastewater from both the Main and Depot campuses as well as reject waste streams from the RWF and the CUP. The treated secondary effluent becomes the input into the RWF with the excess secondary effluent is discharged to the Willimantic River. The RWF draws secondary effluent from the chlorine contact tank at the WPCF and processes the water through membrane microfiltration and ultraviolet light (UV) disinfection systems. The reclaimed water is transferred to a 1.0 MG finished water storage tank and then pumped to a greywater distribution system (separate from the potable water system) after disinfection with chloramine. Distribution system uses presently include the CUP (evaporative cooling and boiler make-up water), the cooling system and for toilet flushing at the IPB, and for toilet flushing at the Engineering and Science Building (ESB). Connection to the Werth Residential Tower for cooling and toilet flushing is pending. When these facilities return their waste streams to the WPCF via the sanitary sewer system, the “reclaimed water loop” is completed.

3.2.4 Interconnection with The Connecticut Water Company

The 2011 *Water Supply Plan* identified CWC as one of several alternatives for providing additional potable water supply to UConn. UConn retained MMI in 2011 to conduct an Environmental Impact Evaluation (EIE)[10] under the Connecticut Environmental Policy Act (CEPA) which fully evaluated the potential environmental impacts of different water supply options. Ultimately, an interconnection with CWC was found to be the preferred alternative in the 2013 Record of Decision for the EIE. Following this determination, UConn and CWC coordinated on a water diversion permit application in 2013 authorizing the transfer of water from CWC to UConn and customers in Mansfield, as well as a December 2013 contractual agreement and “Standard Operating Procedures” document (Appendix B) regarding operation of the interconnection and service to off-campus customers previously served by UConn.

[10] https://envpolicy.uconn.edu/cepa-reports-and-related-documents-for-water-supply/

CWC is presently authorized by DEEP Diversion Permit #DIV201404187 (issued June 2, 2015) to transfer a maximum of 1.85 million gallons per day of potable water from CWC's Northern Operations Western System in Tolland to Mansfield and the UConn public water system. A copy of this water diversion permit is included in Appendix C. The permit expires on May 29, 2040.

Construction of the interconnection was completed in 2016. The CWC water main connects to a meter pit owned by UConn prior to connection with the UConn water supply infrastructure. CWC is responsible for maintaining the interconnection meter. As shown on Appended Figure 1, the interconnection between CWC and UConn is located at the north end of the Main Campus near Route 195.

CWC connects to many of its Mansfield customers through the UConn water system. The contractual agreement between UConn and CWC specifies specific properties which are now served by CWC. These properties are also depicted on Appended Figure 1. CWC provides water service to the properties formerly served by UConn through a series of consecutive water systems (note that detailed descriptions of these systems are now beyond the scope of this *2020 Plan*):

- The CWC UConn Depot Division (former service area off the Depot Campus);
- The CWC UConn Hunting Lodge Division (former service area near Hunting Lodge Road);
- The CWC UConn South Eagleville Division (former service area near South Eagleville Road); and
- The CWC UConn Willowbrook Division (former service area near Willowbrook Road).

In general, the CWC interconnection is operated each day to provide a balance of water. These off-campus areas continue to generally be served with water produced by UConn at its wellfields. The formerly served non-UConn properties that are now CWC customers are metered so CWC can track water use and bill these customers accordingly. Per the contractual agreement, CWC ensures that the amount of water entering from the Western System (as measured at the meter pit) is consistent with the demand in each of the consecutive systems, such that inflow to the UConn system is net neutral with the outflows to these CWC consecutive water systems. Flow rates through the interconnection are controlled remotely by the UConn SCADA system. Thus, although water produced at UConn wellfields continue to serve these areas, the demand is offset by water moving through the interconnection into the UConn system.

Note that to date UConn has not purchased any water from CWC through the interconnection for its internal use. Nevertheless, the interconnection remains an important redundant source of supply for UConn, as well as the means by which a significant decrease in water demand on the Fenton River and Willimantic River Wellfields (through the transferring of customers to CWC) has been realized.

3.3 Source Water Assessment

The Connecticut DPH, in conjunction with the DEEP, completed a *Source Water Assessment Report – An Evaluation of the Susceptibility of Public Drinking Water Sources to Potential Contamination* for the Fenton River Wellfield and the Willimantic River Wellfield in 2003. Appendix D contains copies of the two reports.

Both assessments were completed in accordance with the requirements of the 1996 amendment to the Safe Drinking Water Act. As stated in the reports, an assessment can be used to target and implement enhanced source water protection measures such as inspections, land use regulations, land acquisitions, septic system maintenance, and education.

3.3.1 Fenton River Wellfield

The Fenton River Wellfield has a "low" rating for environmental sensitivity (indicating that the source water area is not sensitive), a "low" rating for potential risk factors (indicating that the source water area has low risk), and a "low" rating for source protection needs (indicating protection of the water source is generally good, at this time). The overall susceptibility rating indicated for the Fenton River Wellfield is "low."

Listed strengths of the source water area are the adoption of local aquifer protection regulations, a Public Water System Source Protection Program, and the fact that less than 10% of the source water area is currently developed for commercial or industrial use. Recommendations of the source water assessment report include maintaining monitoring levels found in the PHC, working with local officials to ensure that only low-risk development occurs in the source water area, and acquisition of open space in the source water area.

3.3.2 Willimantic River Wellfield

The Willimantic River Wellfield also has a "low" rating for environmental sensitivity (indicating that the source water area is not sensitive), a "low" rating for potential risk factors (indicating that the source water area has low risk), and a "moderate" rating for source protection needs (indicating protection of the water source is fair and has some room for improvement at this time). The overall susceptibility rating for the Willimantic River Wellfield is "low."

Listed strengths of the source water area are the same as those for the Fenton Wellfield which include: the adoption of local aquifer protection regulations; a Public Water System Source Protection Program; and the fact that less than 10% of the source water area is currently developed for commercial or industrial use. Recommendations of the source water assessment report include maintaining monitoring levels found in the PHC, monitoring around known contaminant release points, working with local officials to ensure that only low-risk development occurs in the source water area, the completion of Level A mapping (completed by UConn in 2007), and acquisition of open space in the source water area.

3.4 Source Water Protection

UConn and the Town of Mansfield understand the importance and significance of the Fenton River and Willimantic River aquifers and are proactive in their efforts to protect these ground water resources. Furthermore, it is the duty of UConn to ensure the protection and quality of drinking water by following appropriate source water protection strategies. UConn has taken steps to implement some of the recommendations of the *Source Water Assessment Reports,* balancing these actions with the desire to develop land in an environmentally friendly manner. The following is a list of efforts, assessments, and oversight being applied to source water and aquifer protection by UConn.

- UConn controls nearly all of the land within the 200-foot sanitary radius around each of its potable water supply wells (See Figure 3-2 and Figure 3-3). Land that UConn does not control within that radius of each well is not believed to be developable due to its proximity to the Fenton River or the Willimantic River.

- UConn has completed Level A mapping delineating the areas of contribution and recharge to both its wellfields.

- UConn has confirmed the Towns of Mansfield, Willington, and Coventry administer local aquifer protection area (APA) regulations for land that includes the two wellfields. Refer to Section 3.5 below for additional information.

- UConn and/or its contract operator visit both wellfields each day to ensure that equipment is operating properly, grounds are in order, and there are no activities taking place that would be of environmental concern.

- UConn directly interacts with the staff of the Windham Water Works regarding watershed protection in the Fenton River watershed, which is a subset of the watershed above the Windham Water Works' Willimantic Reservoir.

- UConn follows the requirements of CEPA before any major project is constructed. The environmental review process is overseen by the Connecticut Office of Policy and Management and provides an opportunity for all state agencies and interested parties to review and comment on a project before it is allowed to be constructed.

- UConn has developed a close working relationship with the Town of Mansfield regarding development projects occurring both on- and off-campus. Representatives of the Town of Mansfield were part of the Technical Advisory Group for both the Fenton River Study and the Willimantic River Study, and also serve on the Water System Advisory Group.

- UConn encourages input from the public during its Water System Advisory Group meetings, particularly from watershed advocates such as the Naubesatuck Watershed Council and the Willimantic River Alliance.

- The Water System Advisory Group is charged with reviewing the Town of Mansfield and UConn source protection and aquifer protection activities.

The Town of Mansfield has been encouraging watershed protection along the Willimantic River and Fenton River and near their respective wellfields for decades through its Zoning Regulations and Inland Wetland Regulations. Additional protections are enforced through these regulations for land in the public water supply watershed of Windham Water Works, which overlaps with the Fenton River APA.

Refer to Figure 2-2 for a depiction of UConn-controlled, other State-owned, municipal-owned, and land trust lands in the APAs associated with the Fenton River and Willimantic River Wellfields. The following land ownership within the APAs is noted:

- The central and southeast portions of the Willimantic River APA are controlled by UConn. The Town of Mansfield owns a tract of land to the north along the river, Joshua's Trust owns a parcel directly across the river to the west of the Town-owned land, the Town of Coventry owns some land on the western side of the river in Coventry, the State owns a landlocked parcel at the southeast corner of the APA as well as some land along the river in Coventry, and the remainder is privately-owned.

- The western portion of the Fenton River APA is largely UConn- controlled land, with a small parcel owned by Joshua's Trust on Old Turnpike Road. The Town of Mansfield owns one parcel along Route 44 and several parcels near Gurleyville Road on the southern end of the APA. The State and the Town of Willington own land in Willington to the north of Route 44. The remainder of the land in the APA is privately owned.

- The UConn-controlled land in the Willimantic River APA is coincident with a portion of the UConn's Spring Manor Farm. UConn is committed to managing these lands as the Spring Manor Farm for the foreseeable future. Development is not planned, although older dilapidated structures are scheduled for demolition in order to eliminate safety hazards. Furthermore, any development that could be proposed in the future would need to be reviewed per CEPA, and any off-campus development by other landowners would have to be authorized by the Town's aquifer protection regulations.

UConn has prepared a separate management plan for its 440-acre tract near the Fenton River Wellfield. The *East Campus Plan of Conservation and Development* (2004)[11] states that "New structural development is discouraged in this area." The Fenton Forest Tract is located within the UConn-controlled land in the Fenton APA and is identified as "preserved land" in the East Campus plan. Important goals to be accomplished in the tract are "to maintain the health, productivity, and natural biological diversity of the forestlands and to demonstrate forest stewardship practices." Consider the following paraphrased discussion from page 8 of the East Campus Plan of Conservation and Development:

- The Preservation Category for East Campus comprises areas of environmental significance that must be recognized in any future planning effort. These include:

    - Fenton Forest Tract: This 440-acre tract is the largest contiguous forest parcel in the entire UConn system and covers half of the East Campus site. Secondary growth upland central hardwoods dominate both the tract and the region. Particular consideration was given during this study to the age and quality of stands within the Fenton Forest Tract. The oldest timber stands – from 60 to 105 years – are centrally located or found near the Fenton River. These areas, including the Oguswitz Meadow, were considered to be of significance and were identified as special forestlands.

    - Fenton River: The tract is also part of a larger habitat corridor and includes important riparian habitat along the Fenton River – a locally significant water resource. The Windham Water Works' water supply reservoir is fed by the Fenton River. UConn has four wells in this area.

    - Direct Recharge Area: The Connecticut DEEP has approved the delineation of the APA for the Fenton River Wellfield, of which 456 acres are within East Campus. Land use prohibitions and restrictions identified in the Town of Mansfield and Town of Willington APA regulations are therefore relevant to this area.

UConn currently maintains this area in traditional agricultural use or as managed forestland. With the exception of maintaining existing agricultural facilities and continuing forest management and environmental education activities, no development is recommended within the Preservation area.

The 2015 Campus Master Plan indicates that limited development of new science and residential buildings may occur in East Campus as an augmentation of existing uses. However, this development is expected to occur outside of the APA. Any development that could be proposed for the East Campus in the future would need to be consistent with the *East Campus Plan of Conservation and Development* and the Fenton Forest Tract goals, reviewed per CEPA, and would be largely consistent with the Town's aquifer protection regulations.

[11] http://media.masterplan.uconn.edu/Historic/East_Campus_Plan_of_Conservation_and_Dev_2004.pdf

3.5 Wellhead Protection Regulations

3.5.1 DEEP Aquifer Protection Area Regulations

The Aquifer Protection Land Use Regulations[12] were last revised by the State of Connecticut in February 2004. These regulations require that Level A APAs (ground water recharge and contribution areas) be delineated for wells located in stratified drift aquifers serving more than 1,000 people. UConn completed Level A mapping for the Fenton River Wellfield in 2001 and for the Willimantic River Wellfield in 2007. DEEP developed a model ordinance consistent with the regulations to assist municipalities in adopting local regulations. DEEP has identified that Coventry, Mansfield, and Willington each have local regulations consistent with the State's Aquifer Protection Land Use Regulations.

The Town of Mansfield adopted its first APA Regulations on January 17, 2006, with the most recent revision occurring on January 7, 2007. These regulations control certain activities in the Town's formally mapped APAs associated with the Fenton River Wellfield and the Willimantic River Wellfield. The Town of Coventry adopted its regulations on January 24, 2008, and the Town of Willington adopted its regulations on July 1, 2009. Copies of these regulations are included in Appendix E where available.

The Town of Mansfield completed "Mansfield Tomorrow", an update of its Plan of Conservation and Development (MT-POCD)[13] in October 2015; this is the Town's fifth such Plan. The 2015 MT-POCD expressly states Mansfield's strategy to "Protect and conserve groundwater resources", "Maintain and improve health of watercourses, waterbodies, and wetlands", and "Strengthen land use regulations that promote protection of natural systems and habitats." The 2015 MT-POCD places great importance on protecting drinking water supplies to sustain current needs and enable future development in Mansfield. Goal 2.6, Strategy B of the 2015 MT-POCD indicates that the Town of Mansfield will work to "Strengthen regulations protecting critical natural resource areas including water recharge areas, wetlands, water bodies, interior forest tracts, soils and steep slopes", "Identify and evaluate options for expanding protection of stratified drift aquifers and other drinking water resources such as community wells from contamination", and "Establish green infrastructure standards that maximize infiltration of stormwater and natural drainage."

UConn recognizes that the watersheds of small tributaries of the Fenton River are not included in the APA for the Fenton River Wellfield, as they are not direct recharge areas. However, most of these "indirect recharge area" watersheds are located in the "preserved area" described in detail above and identified in the *East Campus Plan of Conservation and Development*. Only the uppermost portion of one indirect recharge area watershed is located in a developed area; this is the stream associated with Mirror Lake. The upper part of this watershed extends from Mirror Lake to the northern side of South Eagleville Road. The UConn-controlled land in this watershed is carefully managed and is continuously evaluated per the *University of Connecticut Storrs Campus Stormwater Management Plan* (2017)[14].

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[12] https://portal.ct.gov/DEEP/Aquifer-Protection-and-Groundwater/Aquifer-Protection/Outline-of-Aquifer-Protection-Regulations
[13] http://new.mansfieldct.gov/DocumentCenter/View/3231/Mansfield-tomorrow_5a1455731723dd74289542c3?bidId=
[14] https://envpolicy.uconn.edu/wp-content/uploads/sites/1389/2017/04/Storrs-Campus-Plan.pdf

3.5.2 DPH Regulations

Environmental Protection Agency (EPA) regulations require significant treatment (filtration and disinfection) of surface water supplies and groundwater supplies under the direct influence of surface water. Potable water from public supply wells within 200 feet of a surface water body are assumed to be at risk and must be tested in order to determine whether the pumped groundwater is not directly connected to surface water.

In the mid-1990s, UConn conducted hydrogeologic studies on certain wells within 200 feet of surface water bodies to determine if groundwater at the Fenton River (Wells A, B, and C) and/or Willimantic River (Wells #1 and #2) Wellfields was under the direct influence of surface water. The Groundwater Under the Direct Influence of surface water (GWUDI) studies were submitted to DPH for review, and State approval letters dated July 27 and 28, 1995 indicated the DPH was satisfied that none of the tested wells were under the direct influence of surface water. A copy of these letters is provided as Appendix F.

In the spring and summer of 2013, DPH conducted a sanitary survey of the UConn potable water system pursuant to public drinking water regulations found in RCSA Section 19-13-B102(e)(7)(E). The DPH survey indicated, in part, that Well D at the Fenton River Wellfield was within 200 feet of a surface water body (wetland). The DPH sanitary survey noted that a GWUDI study could be completed to demonstrate that groundwater withdrawn from Well D was not under the direct influence surface water.

UConn contracted MMI to complete a GWUDI study for Well D in 2014. The MMI report dated April 15, 2015 concluded that Well D was not under the direct influence of surface water from the adjacent wetland and additional treatment measures were not required. The DPH approved the MMI study by a letter dated May 20, 2015. The letter is provided in Appendix F.

3.6 Diversion Permits and Registrations

In addition to being a party to the water diversion permit for the CWC interconnection (DIV-201404187), UConn has a series of water diversion registrations through the Connecticut DEEP. While the majority of the registrations are for public water supply, some of the registrations are recreational. Table 3-3 presents the registrations for the UConn water supply wells. Note that the total registered diversions for each wellfield are less than the sum of the individual registrations for each well. Refer to Appendix C for copies of the water diversion permit and registration confirmation letters.

In 1982, UConn registered Fenton Wells A through D and Willimantic River Wells #1, #2, and #3 with the Connecticut DEEP. MTS registered MTS Well #2 separately. After MTS closed in 1993, the registration for MTS Well #2 was transferred to UConn. UConn installed Well #4 in 1998 to replace the function of MTS Well #2, and the registration rate for MTS Well #2 was transferred to the new Well #4.

The UConn-MTS interconnection is also registered with the DEEP (3100-002-PWS-TR & 3207-005-PWS-TR). This interconnection formerly occurred at a valve pit near the old Chemical Facility at the Willimantic Wellfield, but now occurs inside the new Chemical Facility constructed in 2010. Water treated at the Chemical Facility is directed to the Depot Campus as needed. A previous UConn-MTS interconnection was active through Pink Ravine in the 1960s, but it is believed that this interconnection was abandoned before the 1982 registration deadline as suggested by the "abandoned" 6-inch water main on Weaver Road running towards Bone Mill Road on the 1983 MTS water system map.

TABLE 3-3
Diversion Registrations

Well or Wellfield	Rate (mgd)	Equivalent Rate
Fenton River Well A (3207-001-PWS-GR)	0.576	400 gpm
Fenton River Well B (3207-002-PWS-GR)	1.008	700 gpm
Fenton River Well C (3207-003-PWS-GR)	0.720	500 gpm
Fenton River Well D (3207-004-PWS-GR)	0.720	500 gpm
Subtotal of 4 wells	3.024	--
Fenton River Wellfield Total Permitted Diversion	**0.8443**	**--**
Willimantic River Well #1 (3100-009-INS-GR)	0.648	450 gpm
Willimantic River Well #2 (3100-008-PWS-GR)	0.432	300 gpm
Willimantic River Well #3 (3100-009-PWS-GR	0.648	450 gpm
Willimantic River Well #4 (3100-010-PWS-GR)	0.720	500 gpm
Subtotal of 4 wells	2.448	--
Willimantic River Wellfield Total Permitted Diversion	**2.3077**	**--**

3.7 Flooding

The Willimantic River wells are located in the Special Flood Hazard Area (SFHA) of the Willimantic River, commonly known as the 100-year floodplain. Each well house sits atop a mound that provides elevation of the pumphouse above the floodplain, thus preventing flooding of the wellheads for events equal to or less frequent than the flood with a recurrence interval of less than a 1% chance in any year. The top of each mound is at approximately elevation 312 feet above sea level, while the surrounding ground surface is at an approximate elevation of 300 feet. The 100-year flood elevation is 308 feet.

The SFHA along the Fenton River was mapped by approximate methods. Flood elevations were not determined as part of the Flood Insurance Study (FIS) commissioned by the Federal Emergency Management Agency (FEMA). The four wells may be located adjacent to (are surrounded by) the floodplain, however, the three active wells are not believed to have ever been flooded due to the mounding at each well house.

3.8 Safe Yield Evaluation

Safe yield is the maximum dependable quantity of water per unit of time that may flow or can be pumped continuously from a source of supply during a critical dry period without consideration of available water limitations. The concept of "safe yield" is strictly defined as being in terms of water quantity and does not consider environmental limitations.

A formal safe yield pumping test has not been conducted for either wellfield with all wells pumping simultaneously, although a number of yield tests have been conducted at each wellfield. A *Safe Yield Study* was completed by MMI in March 2020 as part of this *2020 Plan* as presented in Appendix G. The *Safe Yield Study* details known yield tests and other periods of observation, followed by a conclusion relative to safe yield for each wellfield conducted in accordance with DPH procedures.

The total safe yield calculated for the seven active wells at the two wellfields is 4.3441 mgd, of which 2.1678 is from the Fenton River Wellfield and 2.1763 mgd is for the Willimantic River Wellfield. The information in the *Safe Yield Study* has been entered into the required "Worksheet for Determination of Safe Yield", which is included in the first portion of Appendix H. Note that available water limitations (Section 3.9) from diversion registrations, pumping capacity, or other limitations mean that this amount of water is not available to UConn for planning purposes.

3.9 Available Supply

Available supply is the amount of water that can be assumed to be available for planning purposes. It can be lower than the safe yield as encumbered by diversion registrations, treatment limitations, system hydraulics, and wellfield operating protocols.

As required by the DPH, available water has been calculated on the required worksheet which is included in Appendix H. The worksheet reveals that, per applicable regulations and guidance in place at this time, the available water of the UConn water system is 3,647,500 gpd. This volume reflects the fact that water from the Fenton River Wellfield is often unavailable due to the operational protocols in the *Wellfield Management Plan* (as determined by the 2006 "Fenton River Study"), a total of 2,147,500 gpd is available from the Willimantic River Wellfield, and 1,500,000 gpd of water is contractually available to UConn through the CWC interconnection.

Note that although under the strict definition of available water the available supply from the Fenton River Wellfield is zero, the wellfield is typically operated from November through May of each year when flows in the Fenton River are above 3 cubic feet per second (cfs). Use of the Fenton River Wellfields during its operational period will continue to allow balancing of withdrawals with the Willimantic River Wellfield. Furthermore, although at this time purchases of water through the CWC interconnection for UConn use are not necessary, the interconnection provides critical supply redundancy to the UConn water system as well as providing available supply for future planning purposes.

Similar to the 2011 *Water Supply Plan*, this *2020 Plan* also presents the available water supply on a monthly basis in Table 3-4. The times of the year that available water from the Fenton River Wellfield is zero is typically June through October of each year. Note that as the availability of the Fenton River Wellfield is dependent on instream flow conditions, during some dry years water may not be available in the months of May, November, and December; alternatively, during wet years the wellfield may not need to be shutdown at all. However, for monthly planning purposes it is assumed that the wells will be shut down from June through October each year.

The DPH uses the "Largest Well Offline" scenario as a measure of supply redundancy. For the UConn water system, the largest (highest producing) well for planning purposes is Willimantic Well #4 with an available supply of 674,800 gpd. Under this scenario, UConn continues to have 2,972,700 gpd available for planning purposes.

TABLE 3-4
Monthly Available Potable Water Supply

Month	Willimantic River Wellfield (gpd)	Fenton River Wellfield (gpd)	CWC Interconnection (gpd)	Total (gpd)
January	2,147,500	864,000	1,500,000	4,511,500
February	2,147,500	864,000	1,500,000	4,511,500
March	2,147,500	864,000	1,500,000	4,511,500
April	2,147,500	864,000	1,500,000	4,511,500
May	2,147,500	864,000	1,500,000	4,511,500
June	2,147,500	0	1,500,000	3,647,500
July	2,147,500	0	1,500,000	3,647,500
August	2,147,500	0	1,500,000	3,647,500
September	2,147,500	0	1,500,000	3,647,500
October	2,147,500	0	1,500,000	3,647,500
November	2,147,500	864,000	1,500,000	4,511,500
December	2,147,500	864,000	1,500,000	4,511,500

Although the present DPH interpretation of the calculation of available water does not allow for a monthly interpretation as presented in the 2011 *Water Supply Plan*, recent efforts by UConn make a discussion of available water under the "Largest Well Offline" scenario appropriate on a monthly basis. UConn commissioned MMI in 2014 to build upon earlier efforts conducted by UConn and MMI related to evaluating the impact of Fenton Well D on the Fenton River. As described in the *Wellfield Management Plan*, DEEP approved the results of the Low Flow Study of the Fenton River Near Well D (report dated February 26, 2016) by letter dated August 25, 2017. The approval indicates that UConn may utilize Fenton Well D up to a maximum withdrawal of 0.213 mgd during the months of September and October of each year, but only as a backup well. Given that the nature of the request was to utilize Well D when the Fenton River Wellfield would otherwise be shutdown, one or more wells at the Willimantic River Wellfield must be offline for Well D to be used as a backup well.

Table 3-5 summarizes the available supply to the UConn system under the "Largest Well Offline" scenario. As shown in Table 3-5, available supply to UConn under the "Largest Well Offline" scenario varies from 2.97 mgd to 3.84 mgd depending on the time of year.

The projected margin of safety calculation in Section 7.0 will therefore rely on both the "official" available water value (as calculated on the Worksheet for Demonstration of Available Water) of 3,647,500 gpd, as well as the lowest "Largest Well Offline" calculation of available supply in Table 3-5 (2,972,700 gpd) to ensure that sufficient supply will be available under the "Largest Well Offline" condition. These calculations are consistent with the water supply planning regulations. Furthermore, monthly projections will also be presented in Section 7.0 for both scenarios to ensure that sufficient supply will be available on a monthly basis.

Finally, note that although flows from the RWF are tracked by UConn as non-potable production, the RWF does not provide available supply to the UConn potable water system for planning purposes. Instead, flows from the RWF provide a demand reduction for the potable water system, allowing for certain campus uses to be tracked separately from the potable water system. This important distinction will be reinforced throughout this *2020 Plan*.

TABLE 3-5
Monthly Available Potable Water Supply When Largest Well is Offline

Month	Willimantic River Wellfield (gpd)	Fenton River Wellfield (gpd)	CWC Interconnection (gpd)	Total (gpd)
January	1,472,700	864,000	1,500,000	3,836,700
February	1,472,700	864,000	1,500,000	3,836,700
March	1,472,700	864,000	1,500,000	3,836,700
April	1,472,700	864,000	1,500,000	3,836,700
May	1,472,700	864,000	1,500,000	3,836,700
June	1,472,700	0	1,500,000	2,972,700
July	1,472,700	0	1,500,000	2,972,700
August	1,472,700	0	1,500,000	2,972,700
September	1,472,700	213,000	1,500,000	3,185,700
October	1,472,700	213,000	1,500,000	3,185,700
November	1,472,700	864,000	1,500,000	3,836,700
December	1,472,700	864,000	1,500,000	3,836,700

3.10 Margin of Safety

Margin of safety is the unitless ratio of supply over demand. It is system-specific and is based only on available active supplies in consideration of hydraulic or other supply limitations. The PURA and DPH recommend a minimum margin of safety of 1.15 be met for all planning scenarios.

Margin of safety is calculated using a full year of production data (or the average of multiple years of production data) to determine ADD, maximum month average day demand (MMADD), and PDD. These demand scenarios are compared to the available supply presented in Section 3.9. The required DPH worksheet for calculation of margin of safety is presented in Appendix H. Margin of safety calculations for the year 2019 (Table 3-6) indicates that current system margin of safety is adequate with the current sources of supply available to UConn.

TABLE 3-6
Current System Margin of Safety (2019)

Demand Scenario	Available Supply (gpd)	2019 Demand (gpd)	Margin of Safety
Normal Operation			
ADD	3,647,500	723,398	5.04
MMADD	3,647,500	1,190,123	3.06
PDD	3,647,500	1,440,000	2.53
Largest Well Offline Scenario			
ADD	2,972,700	723,398	4.11
MMADD	2,972,700	1,190,123	2.50
PDD	2,972,700	1,440,000	2.06

Similar to the 2011 *Water Supply Plan*, this *2020 Plan* also presents margin of safety from a monthly standpoint in order to better evaluate the interrelationship between the periods each year when students are present as well as the seasonal low-flow period for the Fenton River. Table 3-7 demonstrates that the current margin of safety for the UConn water system is also adequate when considered on a monthly basis, including under the scenario where the largest producing well is offline.

TABLE 3-7
Monthly Margins of Safety, 2019

Month	Total Available Supply (mgd)	Total Available Supply with Largest Well Offline (mgd)	Production (mgd)	Margin of Safety	Margin of Safety with Largest Well Offline
January	4.51	3.84	0.55	8.20	6.98
February	4.51	3.84	0.78	5.78	4.92
March	4.51	3.84	0.78	5.78	4.92
April	4.51	3.84	0.85	5.31	4.52
May	4.51	3.84	0.55	8.20	6.98
June	3.65	2.97	0.44	8.30	6.75
July	3.65	2.97	0.66	5.53	4.50
August	3.65	2.97	0.80	4.56	3.71
September	3.65	3.19	1.01	3.61	3.16
October	3.65	3.19	0.93	3.92	3.43
November	4.51	3.84	0.67	6.73	5.73
December	4.51	3.84	0.50	9.02	7.68

Additional discussion of margin of safety in comparison to projected demands can be found in Section 7.0.

4.0 EXISTING SYSTEM PERFORMANCE

UConn maintains two groundwater sources of water supply for the Main Campus and the Depot Campus. These are the Fenton River Wellfield and the Willimantic River Wellfield. Water from each wellfield is disinfected, pH is adjusted, and corrosion control is added before entering the distribution system.

The UConn water system also receives water through the CWC interconnection that is withdrawn from the Shenipsit Lake Reservoir located in Tolland and Vernon, Connecticut. As described in Section 3.2.4, water has moved through this interconnection since December 2016 to support off-campus customers formerly supplied by UConn. Water from Shenipsit Lake Reservoir is treated by CWC before it is pumped through the interconnection.

Other potable water system components include approximately 31 miles of transmission and distribution system piping, 6 potable water storage tanks, and four booster pump stations (see Table 4-4 for pump descriptions). Each of these system components are described in the ensuing text. Note that this section does not detail non-potable water system components associated with the RWF or the campus grey water system.

4.1 Treatment Facilities

Water from the three active Fenton wells is directed into the 50,000-gallon clearwell located near emergency Well A. Water leaving the Fenton clearwell is treated with sodium hypochlorite (chlorine) for disinfection and sodium hydroxide (25% caustic soda) for pH adjustment and corrosion control. The chemical dosages are paced to flow from a 4-20 milliamp signal. An automatic chlorine residual analyzer continuously measures and records the chlorine residuals. Alarm, status, and initiation signals (on/off) are transmitted to the existing SCADA system using the existing remote telemetry system located at the facility. The treatment system is capable of delivering a maximum capacity of approximately 2.2 mgd of treated water. Table 4-1 summarizes the chemical feed pumps at the Fenton River Wellfield treatment building.

TABLE 4-1
Chemical Feed Pumps at the Fenton River Wellfield Treatment Building

Chemical	Pump	Maximum Pressure	Maximum Treatment Rate
Sodium Hydroxide	Pump 1	100 psi	4 gph
	Spare 1	60 psi	8 gph
	Spare 2	60 psi	9 gph
Sodium Hypochlorite	Pump 1	100 psi	2.5 gph
	Spare	100 psi	2.5 gph

Note: gph = gallons per hour, psi = pounds per square inch.

Water from the four Willimantic wells is directed to the chemical feed building constructed in 2010-2011 near the railroad crossing at the west end of Spring Manor Lane. Treatment includes sodium hypochlorite for disinfection and sodium hydroxide (25% caustic soda) for pH adjustment and corrosion control. Each chemical feed system consists of one bulk tank and one day tank, two chemical metering pumps (one active and one spare) and associated chemical appurtenances. The chemical feed systems are flow paced using an on-site raw water magnetic flow meter. Alarm, status, and initiation signals (on/off) are transmitted to the existing SCADA system using the existing remote telemetry system located at the facility. The treatment system is capable of delivering a maximum capacity of 2.3 mgd of treated water. An automatic chlorine residual analyzer continuously measures and records chlorine residuals. Table 4-2 summarizes the chemical feed pumps at the Willimantic River Wellfield chemical building.

TABLE 4-2
Chemical Feed Pumps at the Willimantic River Wellfield Chemical Building

Chemical	Pump	Maximum Pressure	Maximum Treatment Rate
Sodium Hydroxide	Pump 1	80 psi	10 gph
Sodium Hypochlorite	Pump 1	100 psi	1.3 gph
	Spare 1	300 psi	1.3 gph

4.2 Storage, Pumping, Transmission, and Distribution

4.2.1 Pressure Zones

As shown on Figure 3-1, the UConn water system is comprised of a two primary service zones, the Main Campus and the Depot Campus, that are supplied directly from the pressure in their associated water storage tanks, and two booster pump zones in the Main Campus system that are serviced by the Towers High Pressure Booster Pump Station and the Hilltop Apartments jockey pumps. Each zone is described below and shown on mapping in the *Emergency Contingency Plan*. The associated tanks and pumping stations are discussed in Sections 4.2.2 and 4.2.3.

Main Campus Zone – The Main Campus pressure zone is supplied by both the Fenton River and the Willimantic River wellfields, and includes the Fenton River treatment facility, the 0.05 MG clearwell at the Fenton River Wellfield, the 5.4 MG reservoir at W-Lot, and the twin 1.0 MG water storage standpipes adjacent to the Towers Residence Halls. Pressure in this zone is maintained by the Towers storage tanks. The four well pumps at the Willimantic River Wellfield pump water through the 16-inch transmission main to the 5.4 MG reservoir at W-Lot. The majority of the Main Campus is served with potable water from this zone. Fire protection water is also drawn from the Main Campus pressure zone. Additional information on fire loop pressures is presented in Section 4.2.4.

Towers Loop Zone – The Charter Oak Apartments, the Alan T. Busby Suites, and Husky Village are served by the Towers High Pressure Loop Pumping Station. This booster pumping station can provide flows of up to 8,300 gpm for normal usage, peak usage, and fire protection purposes. Water entering the pump station is drawn from the Towers storage tanks. This station maintains system pressures of at least 140 psi in order to address both potable water system requirements and adequate fire protection within the service area.

Hilltop Apartments Zone – This apartment complex in the southwestern part of the Main Campus is served with the assistance of three 5-horsepower jockey pumps to maintain adequate pressure of at least 80 psi within the Hilltop Apartments complex.

Depot Campus Zone – The Depot Campus Zone is served by water from the Willimantic River Wellfield. This pressure zone includes the two water storage tanks located north (0.75 MG tank) and south (0.5 MG tank) of Route 44 at the Depot Campus. Currently, water is pumped from the four Willimantic River Wellfield wells to the Depot Campus storage tanks when the level in the storage tanks triggers a valve in the chemical feed facility at the Willimantic River Wellfield. From the Depot storage tanks, water service is provided to UConn-owned buildings at the Depot Campus.

4.2.2 Storage Facilities

Six potable water storage facilities serve the UConn system as summarized in Table 4-3. A total of 7.6 MG of useable storage is provided throughout the system for potable use, including the clearwell located at the Fenton River Wellfield. Each of the tanks is further described in the ensuing text.

TABLE 4-3
Summary of Storage Tank Specifications

Specification	Fenton Clearwell	Depot Campus #1	Depot Campus #2	Towers #1	Towers #2	W-Lot Reservoir
Total Capacity (MG)	0.050	0.500	0.750	1.000	1.000	5.400
Useable Capacity (MG)	0.036	0.330	0.500	0.875	0.875	5.000
Overflow	--	33 ft	49 ft	80 ft	80 ft	--
Height	--	35 ft	51 ft	85 ft	85 ft	15 ft
Material	Concrete	Steel	Steel	Steel	Steel	Concrete
Booster Pumps	1 @ 550 gpm 1 @ 1,000 gpm	None	None	None	None	3 @2,750 gpm
Year Constructed	1949	1954	1958	1954	2010	1972
Last Inspection	2017	2013	2013	2009	2012	2015
Condition*	Fair	Fair	Fair	Fair	Good	Good

*Note: Poor would denote significant maintenance, repair, or replacement needed, however, none of the storage tanks are currently found to be in poor condition. Fair denotes a tank in working condition with some maintenance and/or repair needed. Good denotes working condition with no significant deficiencies.

Fenton River Wellfield Clearwell – As described above, raw water from Wells B, C, and D is discharged into a 50,000-gallon clearwell at the Fenton River Wellfield. The clearwell is located adjacent to emergency Well A and is constructed of concrete. The clearwell is divided into two 25,000-gallon sections with separate inlet and outlet piping, and also includes concrete baffling to enhance water detention time within the tank. The clearwell was last inspected in October 2017.

Depot Campus Storage Tanks – The 0.75 MG storage tank on the north side of the Depot Campus is the primary water storage tank for this service zone and measures 51 feet high by 50 feet in diameter. The overflow height is 49 feet. Two older, inactive water storage tanks near this tank date back to the 1910s or 1920s. The 0.50 MG storage tank on the southeast side of the Depot Campus is the secondary storage tank and measures 35 feet high and 25 feet in diameter. The overflow height is 33 feet for this tank. The level set point for both tanks is 26.5 feet with a normal operating range of 25 to 28 feet. Both tanks were last inspected in 2013.

Towers Storage Tanks – The twin 1.0 MG standpipes located in the northeast portion of the Main Campus provide water pressure to the Main Campus service zone. Each tank is 85 feet high by 45 feet in diameter. The overflows are set at 80 feet. The level set point for both tanks is 72 feet with a normal operating range of 67 to 77 feet. Towers #1 was last inspected in 2009 and Towers #2 was last inspected in 2012.

W-Lot Reservoir – This 5.4 MG underground storage tank has dimensions of 180 feet by 280 feet by 15 feet deep. It is divided into two 2.7 MG sections with separate inlet and outlet piping in addition to concrete baffling that enhances water detention time within the tank. The level set point is 13.5 feet with a normal operating range of 13 to 14 feet. The tank was constructed in 1972 to hold water from the Willimantic River Wellfield and was last cleaned and inspected in 2015. The tank is in good condition.

The most recent inspection reports for the W-Lot reservoir, Fenton clearwell, Depot Campus tanks, and the two Towers tanks are included in Appendix I. Note that a seventh 1.0 mgd water storage tank associated with the RWF provides water to the non-potable water system. As this tank is not used for potable water supply, a detailed description is not provided herein.

4.2.3 Pumping Facilities

The pumping facilities that serve the UConn potable water system include well pumps, treatment plant pumping facilities, and distribution pumping facilities. Pumping facilities are summarized in Table 4-4 and described below.

Fenton High Lift Pumping Station – Located at the Fenton River Wellfield treatment facility, this pumping station originally moved finished water up to the twin 1.0 MG standpipes adjacent to the Towers Residence Halls. System improvements were installed in 1998 to allow for finished water to be routed to the 5.4 MG reservoir instead. The pumps are controlled by the SCADA system based on the level in the 1.0 MG standpipes and the clearwell. Emergency power supply is available for the Fenton pumping station.

High Head Pumps – The High Head pumping station consists of three 100 HP pumps capable of moving finished water at a rate of 2,750 gpm from the 5.4 MG reservoir into the twin 1.0 MG storage tanks. Each pump is equipped with VFD to provide constant pressure. Emergency power supply is available for the High Head pumping station.

Towers Booster Pump Station – Located near the 5.4 MG reservoir, this pump station uses as many as eight pumps to boost water into the Towers Loop Zone. Five pumps supply normal demand volume, with two pumps in reserve to assist with peak demand. The eighth pump can provide as much as 3,500 gpm for fire flows. Each pump is equipped with VFD to provide constant pressure. Water passing through this pump station is drawn from the twin 1.0 MG storage tanks. Emergency power supply is available.

Hilltop Apartments Jockey Pumps – This booster station provides constant water pressure to Hilltop Apartments. The booster station contains three Jockey pumps. Water passing through this pump station is drawn from the twin 1.0 MG storage tanks. Emergency power supply is not available to this pumping station. When the pumping station is offline, substandard (low) water pressure is still available in the Hilltop Apartments zone.

TABLE 4-4
Summary of Pumping Specifications

Pump Location	Horsepower (hp)	Year of Pump Installation	Condition*	Aux. Power
Fenton River Well A Pump and Motor	5	1977	Good	Yes
Fenton River Well B Pump and Motor	10	2015	Good	Yes
Fenton River Well C Pump and Motor	10	2015	Good	Yes
Fenton River Well D Pump and Motor	25	2008	Good	Yes
Fenton High Lift Pump – 500 gpm VFD	125	2007	Good	Yes
Fenton High Lift Pump – 1,000 gpm VFD	200	2002	Good	Yes
Willimantic River Well #1 Pump and Motor VFD	100	2018	Good	Yes
Willimantic River Well #2 Pump and Motor VFD	30	2019	Good	Yes
Willimantic River Well #3 Pump and Motor VFD	100	2019	Good	Yes
Willimantic River Well #4 Pump and Motor VFD	100	2018	Good	Yes
High Head #1 – 2,750 gpm VFD	100	Late 1990s	Good	Yes
High Head #2 - 2,750 gpm VFD	100	Late 1990s	Good	Yes
High Head #3 - 2,750 gpm VFD	100	Late 1990s	Good	Yes
Towers Booster Pump Station #1 – 50 gpm VFD	7.5	2013	Good	Yes
Towers Booster Pump Station #2 – 250 gpm VFD	25	2013	Good	Yes
Towers Booster Pump Station #3 – 250 gpm VFD	25	2013	Good	Yes
Towers Booster Pump Station #4 – 500 gpm VFD	40	2013	Good	Yes
Towers Booster Pump Station #5 – 1,250 gpm VFD	40	2013	Good	Yes
Towers Booster Pump Station #6 (Peaking) – 1,250 gpm VFD	125	2013	Good	Yes
Towers Booster Pump Station #7 (Peaking) – 1,250 gpm VFD	125	2003	Good	Yes
Towers Booster Pump Station #8– 3,500 gpm VFD	350	2003	Good	Yes
Hilltop Apartments (constant pressure Jockey pump)	5	2003	Good	No
Hilltop Apartments (constant pressure Jockey pump)	5	2003	Good	No
Hilltop Apartments (constant pressure Jockey pump)	5	2003	Good	No

Note: All VFD pumps have variable rates.

*Poor condition would denote significant maintenance, repair, or replacement needed; however, all pumps are currently in good condition. Fair would denote working condition with some maintenance and/or repair needed. Good denotes working condition with no significant deficiencies; which is the case for all pumps, at the time this report was issued.

4.2.4 System Pressures and Fire Protection

System pressures fluctuate with the time of day. Maximum pressures generally occur at night when demand is slightly lower. Industry standards recommend pressures in the range of 35 psi to 125 psi. In general, pressures are sufficient in the UConn water system to provide adequate service to the top floors of buildings.

According to CDM Smith[15], the majority of the distribution system on the Main Campus experiences pressures in the range of 29 psi to 170 psi, with approximately 86% of the service area having pressures between 35 psi and 100 psi. Areas of highest pressure (above 100 psi) include lower elevation areas along North Eagleville Road and Hunting Lodge Road (these areas are now served by CWC), and at each wellfield. The fire protection system has static pressures ranging from 130 to 180 psi. The Towers Loop pressure zone is operated at a range of 120 to 160 psi, with pressure averaging 140 psi, in order to maintain 140 psi on the discharge side of the booster station. Areas of low pressure (below 35 psi) occur in less than 1% of the service area and occur directly around the Towers standpipes and along Route 195 near Horsebarn Hill Road and Tower Loop Road due to higher elevations in these areas. Although the Depot Campus was not analyzed by CDM Smith, pressures in the Depot Campus zone typically range from 30 psi to 85 psi, with slightly higher pressures realized in the CWC off-campus system.

Fire protection is provided throughout the service areas. The Main Campus receives its fire protection from a combined domestic/fire protection distribution system, with a dedicated fire loop system for the central campus. The fire loop system serving the Main Campus takes its water from the Towers 1.0 MG standpipes. Two fire pumps at South Campus and the CUP also supplement this system for those specific buildings.[16] The Towers loop booster station provides fire service for Husky Village and the Charter Oak Suites and apartment complexes with water drawn from the Towers 1.0 MG standpipes. The Depot Campus receives fire protection through a combined domestic water/fire protection distribution system with pressure provided by the two storage tanks.

The Insurance Services Organization (ISO) provides target fire flows for residential areas of between 750 gpm and 1,000 gpm, and greater than 1,500 gpm to 2,500 gpm for commercial areas. Previous fire flow testing conducted in 2008, 2009, and 2011 met ISO fire flow criteria at all tested locations, including sites in different pressure zones.

A hydraulic model of the UConn water system was initially developed in 2008 and was updated in 2010 in connection with the 2011 *Water Supply Plan*. In July 2016, CDM Smith developed and calibrated a hydraulic model of the UConn water transmission and distribution system for the Main Campus. The model includes all pipes and tanks at the Main Campus, but not the pipes that are generally considered to be laterals (see discussion in Section 4.2.5). In order to calibrate the 2016 hydraulic model, CDM Smith conducted fire flow testing on June 1-2, 2016 at 18 fire hydrant locations listed below. Each hydrant was connected to a water main of 12-inch diameter or less. The tests achieved nighttime fire flows ranging from 391 gpm to 2,089 gpm.

- South Residence Halls – 1,876 gpm
- Whitney Road – 1,799 gpm
- Gampel Pavilion – 993 gpm
- Alumni Drive – 2,089 gpm
- Garrigus Suites – 775 gpm
- Hilltop Apartments – 756 gpm
- N. Eagleville Rd. & Northwood Apts. – 1,342 gpm
- Celeron Square – 1,050 gpm
- Charter Oak Apartments – 1,363 gpm
- Swan Lake – 1,311 gpm
- Route 195 and Beach Hall – 391 gpm
- Willowbrook Road – 391 gpm
- Storrs Road at Mirror Lake – 566 gpm
- Storrs Downtown – 1,332 gpm
- Mansfield Apartments – 590 gpm
- Gilbert Road – 876 gpm
- Mansfield Road – 908 gpm
- Fairfield Way – 981 gpm

[15] CDM Smith, 2016, *Final Report: University of Connecticut Framework Utility Analysis Phase 1 – Existing Conditions: Potable Water & Fire Protection Distribution System Model*, University of Connecticut.
[16] These fire protection facilities are not considered part of the potable water system as they only increase fire pressure for those specific buildings / complexes. Therefore, detailed descriptions of these pumps are not included herein.

At first glance, it would appear that some locations do not have fire flows consistent with ISO standards listed above. Note however that as the testing was done to calibrate the hydraulic model, the June 2016 tests do not necessarily indicate the total fire flow available for a particular area. For example, in areas of lower hydrant flows, there are more hydrants available than were tested that could provide additional fire flow to these areas consistent with ISO standards. Section 4.5 presents additional detailed information about the hydraulic model.

CDM Smith ran the July 2016 hydraulic model to evaluate fire flows under the PDD scenario and found that the available fire flow on the Main Campus ranges from 500 gpm to 5,000 gpm while maintaining a minimum system pressure of 20 psi. Fire flows on the lower end of this range were typically on the outskirts of the system (e.g. Willowbrook Road, now served by CWC) and were due to insufficient hydraulic looping in these areas. Approximately 85% of the hydrants on the Main Campus could provide fire flows above 1,000 gpm under this stressed condition.

4.2.5 Transmission and Distribution System Infrastructure

Water system inventories in previous *Water Supply Plans* have reported a total of approximately 6 miles of water transmission main and more than 30 miles of distribution mains. The piping age has been reported from new to dating back to the 1920s. Many of the older mains were replaced with new pipes as part of the UConn 2000 initiative; however, detailed records of the water system main improvements have not been kept in an accessible central database or mapping inventory.

Electronic mapping of the distribution system was originally completed in November 2005 by UConn and was updated for use in the *Water and Wastewater Master Plan* in 2007 and for the previous *Water Supply Plan* in 2011. UConn's 2011 *Water Supply Plan* included an overall summary of pipe lengths, size, and condition. As of 2011, the UConn water system was estimated to include approximately 54.7 miles of water mains, including 6.4 miles of transmission mains and 29.8 miles of distribution main. The remaining mains included service connections and laterals. Beginning in 2016, CDM Smith has been compiling the distribution system mapping into an electronic utilities atlas that provides a current basis for analysis.

As previously noted, UConn and CWC entered a water supply development agreement in December 2013 which included the transfer of off-campus infrastructure to CWC on a 60-year depreciation schedule. Effectively, any mains greater than 60 years old become owned by CWC. Nevertheless, CWC is responsible for the operation and maintenance of the off-campus infrastructure regardless of ownership. Exhibit 6.1 of the December 2013 agreement identifies 6.7 miles of distribution mains (as well as an additional 5.4 miles of related laterals and service connections) that are now the responsibility of CWC. To date, approximately 1.7 miles (of the 6.7 miles total) of the distribution mains have fully depreciated and transferred ownership to CWC.

Tables 4-5 summarize the results of the pipe evaluation, which includes recent main installations such as along Discovery Drive. Note that the figures in Tables 4-5 include all mains associated with the UConn water system and not those that are the responsibility of CWC. In summary, the UConn potable water system currently consists of approximately 50 miles of pipe ranging in size from 0.5 inches to 20 inches in diameter. Transmission mains are typically 8-inches to 20-inches in diameter (Table 4-6). The vast majority of distribution pipe ranges from 6-inches to 12-inches in diameter, with laterals and service connections typically ranging from less than 1-inch to 8 inches in diameter.

TABLE 4-5
UConn Water Main Summary

Pipe Purpose	Approx. Total Length Potable System	Approx. Total Length Fire System
Main Campus		
Transmission	8.0 miles*	N/A
Distribution	18.6 miles	7.4 miles
Laterals & Service Connections	8.3 miles	N/A
Depot Campus		
Transmission	1.0 miles	N/A
Distribution	3.1 miles	N/A
Laterals & Service Connections	3.6 miles	N/A
Total		
Transmission	9.0 miles	N/A
Distribution	21.7 miles	7.4 miles
Laterals & Service Connections	11.9 miles	N/A
Total All Mains	**50.0 miles**	

*Includes transmission mains at both wellfields.

Note: The Depot Campus receives fire protection through a combined domestic water/fire protection distribution system.

Because the system is not comprised exclusively of water mains beneath roadways, and because UConn property lines do not cleanly separate roadways from building lots in different parts of the Main Campus and Depot Campus, a clear division between the water system laterals and water mains is not always possible. Note that on UConn property most water mains are found beneath roads, but mains may also be located under quadrangle areas and buildings. Additional off-campus mains are still owned by UConn but are under the control of CWC. Off-campus water mains, which are now managed by CWC, were typically installed within roadways.

All of the transmission, distribution, and service mains in the UConn system are believed to be in fair or better condition. Appendix J presents the current condition assessment for each general area of the water system. UConn and NEWUS evaluate condition based on pipe age, type, and recent break patterns and also evaluate the interior of pipes whenever coupons are installed.

UConn retained CDM Smith to update the mapping of the distribution system in 2019. The summaries herein are based on CDM's efforts to date. This project is ongoing, and when completed will provide an updated summary of pipe materials (Table 4-7), lengths, and sizes. This information will supplement the condition assessment in Appendix J once it becomes available, and in conjunction with the hydraulic model will inform UConn's water main cleaning, relining, and replacement program for underground infrastructure over the next several years.

TABLE 4-6
Pipe Size Summary

Pipe Size	Length (mi)
¾-inch	0.1
1-inch	0.3
1 ¼-inch	0.1
1 ½-inch	0.1
2-inch	1.6
2 ½-inch	<0.1
3-inch	0.8
4-inch	1.4
6-inch	3.5
8-inch	11.8
10-inch	4.1
12-inch	8.6
16-inch	4.6
20-inch	0.8
Unknown	12.2
Total	**50.0**

TABLE 4-7
Pipe Type Summary

Pipe Type	Length (mi)
Cast iron	7.7
Copper	0.4
Ductile iron	13.5
Plastic-Steel Composite	0.1
Polyvinyl Chloride	0.1
Steel	0.2
Transite	0.1
Unknown	27.9
Total	**50.0**

A number of improvements to the distribution system have been completed in the past few years, including the replacement of a select number of transmission and distribution water mains. Table 4-8 summarizes the new or replacement water mains installed since 2011.

TABLE 4-8
New or Replaced Water Transmission and Distribution Mains Since 2011

Year	Project	Type	Diameter (in)	Length (ft)	Material
2014	Replace Willimantic River Treatment Building to Hunting Lodge Road	Transmission	16	13,350	Ductile Iron
2016	Replace Hunting Lodge Road to 5.4 MG Reservoir	Transmission	16	4,000	Ductile Iron
2016	Replace 5.4 MG Reservoir to Towers Storage Tanks	Transmission	20	1,000	Ductile Iron
2016	Connect to IPB and to CWC Interconnection	Distribution	12	4,000	Ductile Iron
2016	Install main on Discovery Drive	Distribution	12	3,468	Ductile Iron
2018	North Eagleville Road Replacement	Distribution	12	1,068	Ductile Iron
2019	Athletic District Redevelopment	Distribution	8	676	Ductile Iron
2019	Athletic District Redevelopment	Distribution	6	210	Ductile Iron
2019	Athletic District Redevelopment	Distribution	4	57	Ductile Iron
2019	Replace Water Mains During Fine Arts Project	Distribution	12	170	Ductile Iron
2019	Replace Water Mains During Fine Arts Project	Distribution	8	75	Ductile Iron

In 2016, UConn completed two phases of a construction project that replaced the main transmission pipe connecting the Willimantic Wellfield to the Main Campus storage and distribution system. Approximately 4,000 linear feet of new 16-inch diameter pipe was installed. This project also included connecting to the IPB and the CWC Interconnection. Additional water main replacements occurred during the Athletics District redevelopment project and the Fine Arts redevelopment project.

Major water main breaks sometimes occur in the UConn water system, but they are repaired immediately. In 2017, approximately ten major leaks occurred, which resulted in losses of potable water. A few of the 2017 breaks were related to a utility project that was in process at that time, but the majority of breaks in the system are related to age and/or cold weather. One major leak occurred in 2018, and no major leaks occurred in 2019. Three occurred in early 2020. Table 4-9 summarizes the main breaks that have occurred since 2017.

Leak detection is an important component of maintaining the transmission and distribution systems. The most recent water leak detection survey was conducted from August 23, 2016 through September 1, 2016. The survey found 6 hydrants were not completely closed. The hydrants were closed and re-inspected.

NEWUS currently conducts leak detection surveys every five years, targeting specific areas of the system. This is consistent with the schedule required by the water diversion permit for the CWC interconnection. Copies of the most recent leak detection reports are included in Appendix K.

TABLE 4-9
Recent Water Main Breaks

Month & Year	Location	Estimated Loss Volume (gallons)
July 2017	Lakeside Building	25,000
August 2017	South Eagleville Road	36,000
October 2017	Lakeside Building	50,000
December 2017	White Building	25,000
December 2017	North Campus Residence Halls	35,000
December 2017	Tasker Admission Building	25,000
December 2017	Jorgensen Auditorium	15,000
December 2017	Hillside Road at West Campus	25,000
December 2017	Lakeside Building	65,000
July 2018	North Eagleville Road	165,000
January 2020	Student Recreation Center	54,000
January 2020	Fairfield Way	30,000
January 2020	Fine Arts Building	36,000

4.2.6 Consumptive Use Metering

UConn worked diligently from 2005 to 2011 to install meters on UConn-owned buildings on both campuses, and most off-campus buildings that were formerly served by the UConn system but are now customers of CWC. A number of low water use buildings remain unmetered. Only a few larger buildings remain unmetered at this time, and these are suspected to have low water usage primarily consisting of sanitation needs.

It is not considered cost-effective for UConn to provide 100% metering of the buildings on both campuses, especially since water usage at the Depot Campus is negligible in certain buildings that are seldom and/or under-utilized. Nevertheless, UConn continues to work towards more accurately characterizing unaccounted-for water.

The current metering program has two primary goals. First, UConn is committed to ensuring that at least 85% of production is metered as consumption. In this way, UConn will maintain unaccounted-for water below 15% of production. This program includes regular calibration of all source meters (see Appendix L for most recent calibration reports dated January 2019). Second, UConn is working towards the goal of bringing existing building water meters up to the current UConn metering standard. A copy of the metering standard document is included in Appendix L. This program includes inspection, maintenance, repair and/or replacement of all existing meters on a regular basis. The second goal of the metering program includes the following elements:

- Buildings expected to be taken out of service in the near future will not be metered.
- When buildings are replaced, or renovated, they will be fitted with a meter that meets the current UConn standard. Recent examples include the ESB and the Student Recreational Facility.
- All meters are part of a preventative maintenance program to ensure meters are functioning properly and meet the new UConn metering standard.

A campus-wide inventory of water meters, including the type of meter, size, etc., was completed in 2017. The resulting list of meters was reviewed, and inspection work was prioritized and separated into phases, based on the size of each building (e.g., buildings >20,000 square feet [sf]) and type of water-use activities (residential, academic, administrative) anticipated at each building. To date, a number of meters located in residential buildings and academic/science buildings, which would typically have higher water demand, have been repaired and/or replaced to meet the new standard. A line item has been included in the water supply system Improvement Tables in Section 7.0 for continued metering in accordance with the above program.

4.3 Operations and Maintenance

4.3.1 System Operations

As explained in Section 2.2, UConn's water systems (including the Fenton River and Willimantic River Wellfields) are owned and managed by UConn. The contract operator for the water system is NEWUS, a subsidiary of CWC. NEWUS staff are responsible for the day-to-day operation of the water system and for ensuring that water quality meets state and federal drinking water standards. NEWUS is also responsible for providing 24-hour response to water system emergencies.

UConn and NEWUS conduct water system management and operations at the Facilities Building located off LeDoyt Road. The water system is automated by a computer-controlled SCADA system. The SCADA system continuously monitors production from wells, water treatment, storage levels, water distribution, and water quality.

Facilities staff and NEWUS personnel also monitor the system operations through more traditional means. For example, visual inspections are conducted at the wellfields, treatment plants, storage facilities, and pumping stations to confirm equipment is functioning properly and maintenance issues are identified in a timely manner.

4.3.2 System Maintenance

NEWUS staff operate and maintain the wells, treatment facilities, distribution system piping, and associated storage and pumping facilities. These individuals are responsible for performing minor maintenance on equipment during routine system inspections, scheduling major maintenance, collecting water samples for subsequent laboratory analysis to meet regulatory requirements, monitoring daily chemical dosage and water production, and completing other tasks listed in Table 4-10.

Specialized routine maintenance functions are contracted out. These include maintenance of the SCADA computer system and instrumentation, well redevelopment, and calibration of certain treatment equipment.

Copies of all safety data sheets (SDSs) for chemical additives used at the treatment facilities are kept on-site and at the UConn Facilities Operations building. Files are also kept that document equipment maintenance and emergency responses.

Similar to SDSs, various Operation and Maintenance Manuals for different equipment and components of the water supply system are kept at the treatment facilities and at the Facilities Operations building.

TABLE 4-10
Operation and Maintenance Schedule

Daily Schedule	
Routine readings and inspections	Logbook entries
Water quality testing per DPH requirements	Pumping station inspections
Weekly Schedule	
Water quality testing per DPH requirements	Inspect wells
Minor maintenance as necessary	Inspect tanks and clearwell
Monthly Schedule	
Water quality testing per DPH requirements	Submit monthly reports to DPH
Dead end flushing	Certain customer meter reading
Quarterly Schedule	
Water quality testing per DPH requirements	Certain customer meter reading
Semi-Annual Schedule	
Water quality testing per DPH requirements	Water main flushing
Annual Schedule	
Water quality testing per DPH requirements	Service emergency generators
Calibrate flow meters	Publish Consumer Confidence Report
Cross connection & backflow survey	
As Needed	
Update maps and records	Clean and repair service distribution lines
Meter repairs	Utility mark-outs
Response to complaints	Service alarm system
Grounds maintenance of well sites	Inspect, clean, and repair tanks

4.4 Water Quality

4.4.1 Regulatory Overview

Safe Drinking Water Act

Prior to 1974, the major responsibility for regulation of public drinking water supplies rested on State Government. In 1974, the Federal Safe Drinking Water Act (SDWA) was passed. The SDWA authorized the Federal Government to set national drinking water standards, conduct special studies, and to generally oversee the implementation of the SDWA. However, primary responsibility of implementation and enforcement essentially remained in the hands of State government.

Subsequent to the passage of the SDWA, interim primary drinking water regulations were promulgated. These regulations and subsequent revisions set standards for organic, inorganic, and microbiological contaminants; turbidity; radionuclides; and trihalomethanes.

In June of 1986, amendments to the SDWA were adopted. The amendments converted interim and revised primary drinking water standards to national primary drinking water regulations and converted recommended maximum contaminant levels to maximum contaminant level (MCL) goals.

The SDWA was reauthorized in 1996. The law focused water program spending on the contaminants believed to pose the greatest risk to human health and are most likely to occur in a given water system. It also required water systems to notify the public of water safety violations within 24 hours. The reauthorized SDWA maintains requirements that EPA set both a maximum contaminant level and a maximum contaminant level goal for regulated contaminants based on health risk reduction analysis that includes a cost/benefit consideration. The reauthorized Act also required EPA to establish a database to monitor the presence of unregulated contaminants in water.

At the State level, the authority for regulation of drinking water is established under CGS Section 25-32 and implemented through the PHC. These requirements are consistent with Federal Regulations and have additional requirements such as annual watershed surveys, annual cross connection surveys, monitoring of raw and finished water, and public notification requirements.

Volatile Organic Compounds

Since the adoption of the 1986 amendments, the EPA has been working towards promulgating national primary drinking water regulations for various parameters. On July 8, 1987, EPA published regulations setting MCLs and MCL goals for eight volatile organic compounds (VOCs) and monitoring for a number of additional VOCs that did not have MCLs. These regulations became effective January 9, 1989. In May of 1989, EPA proposed national primary drinking water regulations for 38 more inorganic and organic drinking water contaminants.

On January 30, 1991 (effective date July 30, 1992), EPA promulgated MCLs for a series of parameters referenced as the "Phase II" compounds, which include nine inorganic compounds, 10 VOCs, and 15 synthetic organic compounds (SOCs). Monitoring requirements were specified for an additional 24 SOCs that did not have MCLs. On July 17, 1992 (effective date January 17, 1994), EPA promulgated water quality regulations that identified "Phase V" compounds, including five inorganic compounds and three VOCs with MCLs, and 21 VOCs and 15 SOCs that did not have MCLs.

Lead and Copper Rule

On June 7, 1991, the EPA promulgated maximum contaminant goals and National Primary Drinking Water Regulations for controlling lead and copper. These regulations were adopted pursuant to the Lead Contamination Act of 1988. The regulations specify a treatment technique that includes optimal corrosion control treatment, source water treatment, lead service line/connection replacement, and public education. The lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period is greater than 0.015 milligrams per liter (mg/L). The copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples is greater than 1.3 mg/L. Following the first two monitoring periods, if lead and copper levels were less than or equal to the action levels, water monitoring could be reduced. In 2000 EPA published revisions to the Lead and Copper Rule that included streamlining/reducing monitoring and reporting burdens and strengthening the implementation of the rule in the following areas: monitoring, treatment processes, public education, customer awareness, and lead service line replacement. The revisions were finalized in October 2007.

Ground Water Under the Direct Influence of Surface Water

In 1991, the DPH adopted regulations and criteria pursuant to the EPA Surface Water Treatment Rule to evaluate all community ground water sources by June 29, 1994, to determine if the sources were under the direct influence of surface water. Sources of supply under the direct influence of surface water require disinfection and filtration to remove pathogens that may adversely affect human health. UConn conducted a GWUDI study from 1993 to 1994. It was subsequently determined that none of the tested wells (Wells A, B, and C at the Fenton River Wellfield, and Wells #1, #2, and #3 at the Willimantic River Wellfield) were under the direct influence of surface water. A subsequent study conducted for Fenton Well D in 2014 resulted in a similar conclusion. Correspondence from DPH is included in Appendix F.

Disinfection Byproducts

In December 1998, EPA published the Stage 1 Disinfectants/Disinfection Byproducts Rule (DBPR). This Rule requires water suppliers to use treatment methods to reduce the formation of disinfection byproducts and to meet associated water quality standards. The disinfection byproducts and their corresponding standards include the total trihalomethanes (TTHM) and haloacetic acids (HAA5). The total TTHM is measured as the total concentration of chloroform, bromoform, bromodichloromethane, and dibromochloromethane. The EPA standard for TTHM concentration is 80 ppb. The HAA5 is measured as the total concentration of monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid. The EPA standard for HAA5 is 60 ppb. Both disinfection byproduct standards are based on annual averages.

The Stage 2 DBPR was published by EPA in January 2006. The purpose for the second stage is to improve public health protection by reducing health risks connected to large concentrations of disinfection byproducts throughout the entire supply system. The Stage 2 DBPR emphasizes the monitoring and reduction of concentrations of TTHM and HAA5 at sampling locations throughout the distribution system. The monitoring frequency and sampling locations are dependent upon the population size which the distribution system serves, inclusive of the system that provides the water.

Total Coliform Rule

The EPA developed and published the Ground Water Rule in 2007 to provide increased protections against microbial pathogens in public water systems that use groundwater sources. The Ground Water Rule targeted groundwater systems that are susceptible to fecal contamination, instead of requiring disinfection for all groundwater systems. The occurrence of fecal indicators in the water supply indicated the potential presence of microbial pathogens that pose a threat to public health. The rule requires systems to conduct monitoring; and those systems where the presence of fecal indicators are detected are required to take corrective actions to reduce exposure.

The revised Total Coliform rule was published February 2013 by EPA. This rule applies to all public water systems and included changes on how coliform is monitored and the corrective actions if a positive sample is detected. The updates to the rule include public water systems maintaining a sample site plan and Level 1 and 2 assessments are defined.

4.4.2 Water Quality Monitoring Program

UConn's water quality monitoring program is conducted in accordance with State and Federal requirements. The program in place for the water system is consistent with the Water Quality Monitoring Schedule posted on the DPH website[17].

UConn has two entry point sample locations (Willimantic River Wellfield and Fenton River Wellfield) which are both listed on the DPH Water Quality Monitoring Schedule. Each of the seven active wells has a raw water sampling location. Note that because Fenton Well A is currently maintained as an emergency well, raw water quality is not regularly monitored in the well at this time. Furthermore, interconnection source water quality is the responsibility of CWC. Finally, note that approximately 60 UConn distribution system sampling sites are maintained.

Tables 4-11 through 4-13 summarize the water quality monitoring program and the frequencies of various analyses.

TABLE 4-11
Raw Water Quality Monitoring Program

Parameter	Monitoring Frequency
Physical (Color, Odor, pH, Turbidity)	Not required; as needed
Nitrogen Compounds	Not required; as needed
Inorganic Compounds (iron, manganese)	Not required; as needed
E. Coli	1 sample per month

TABLE 4-112
Entry Point Water Quality Monitoring Program

Parameter	Monitoring Frequency
Chlorine Residual & pH	Daily
Nitrogen Compounds	1 sample annually
Inorganic Compounds (Iron, Manganese, Copper)	1 sample every three years
Volatile organic compounds (VOCs)	1 sample annually
Pesticides, PCBs, Herbicides (SOCs)	2 samples every three years
Radiologicals	1 sample every three years

[17] https://portal.ct.gov/DPH/Drinking-Water/DWS/-/media/Departments-and-Agencies/DPH/dph/drinking_water/pdf_schedules/Schedules_MANSFIELD_C.pdf

TABLE 4-13
Distribution Water Quality Monitoring Program

Parameter	Monitoring Frequency
Physical Parameters	30 samples per month
Total Coliform	30 samples per month
Lead and Copper	30 samples every three years
Disinfection Byproducts	4 samples per quarter
Asbestos	2 samples every nine years

An annual CCR on water quality is completed each year. UConn's 2017 and 2018 annual CCRs include data for both UConn well fields and for the CWC Northern-Western water supply sources (which includes the Shenipsit Lake Reservoir). The 2017 and 2018 reports are attached in Appendix M.

4.4.3 Entry Point Monitoring

Maximum nitrate levels are typically on the order of 1.0 mg/L in treated water at the entry points. Sodium and chloride levels are typically in the range of 12 to 26 mg/L. VOCs, SOCs, and radiological parameters are either not detected, or detected at levels below their MCLs. Samples are also collected in accordance with the Unregulated Contaminant Monitoring Rule.

4.4.4 Distribution Monitoring

Approximately 60 samples per month are collected at various locations throughout the distribution system, including customer taps, tanks, and pumping stations and are tested for physical and bacteriological parameters. A total of 30 samples are also collected for lead and copper testing every three years. Testing for asbestos is conducted every nine years and was last tested for in 2013.

No coliform violations occurred during the last five years of routine testing. Lead and copper detections have been lower than their criteria. Asbestos has not been detected in distributed water.

Disinfection byproduct levels have generally been low, consistent with the primary use of groundwater. These have increased slightly in recent years as water from the CWC interconnection has been utilized in the Main Campus service zone but continue to be well below the MCLs. Recent testing in March 2019 found TTHM to be in the range of 15-20 ppb, and HAA5 to be in the range of 8-10 ppb.

4.4.5 Cross Connections

As of 2019, 769 cross connection control devices have been installed at the Main Campus and Depot Campus to prevent backflow of water from equipment/fixtures into the UConn distribution piping system. An annual cross connection survey is conducted whereby approximately 223 buildings are investigated to determine if there are potential cross connections and test the equipment for evidence of backflow. Annual reports of the cross-connection survey are submitted to the DPH. Table 4-14 presents the results of the most recent cross connection survey conducted in 2019.

TABLE 4-14
Summary of 2019 Cross Connection Survey Report

Survey Item	Count
Total Devices Tested	769
Total tests Performed	769
Total Number of Failures	35
Total Repairs	35

In 2019, 35 failures were detected. A total of 35 of the failures were repaired and retested to confirm successful repair.

4.4.6 Summary

A review of the water quality data collected over the past ten years indicates that the overall water quality is good, and with appropriate treatment the UConn potable water supply will continue to exhibit appropriate water quality. Entry point and distribution waters have an excellent compliance record and meet State and Federal requirements. No violations of water quality regulations have occurred in the past ten years for raw, entry point, or distribution water.

4.5 Hydraulic Model

Development of a hydraulic model of the UConn water system originally began in 2006 and was completed by Tighe & Bond, Inc. under subcontract to MMI in connection with the 2011 *Water Supply Plan*.

The pre-existing hydraulic model was used by CDM Smith as the basis for developing the current hydraulic model of the Main Campus transmission and distribution system in 2016. The software application InfoWater, which is fully integrated with ArcGIS software, was used to create an accurate representation of a distribution system and to perform real time hydraulic simulations. The model database includes metadata and descriptive information to define, manage, and organize the node and pipe facility data. Information such as pipe and pipe junctions (age, diameter, length, material, internal roughness), pump data, tanks, valves, and controls were incorporated into the model. Additionally, CDM Smith conducted fire hydrant flow testing to calibrate the model. Note that the Depot Campus service area is not included in the model, nor were many laterals and service connections directly included (e.g., demands were applied to distribution pipe segments as opposed to being directly modeled through service connections).

Based on the results of the calibrated model, the UConn transmission and distribution system on the Main Campus was considered to be sufficient and accurately calibrated for a system wide analysis. The calibrated computer model was able to simulate the system under existing conditions and evaluate flow, pressure, and fire flow. Using the model, CDM Smith completed the following tasks:

- Evaluated water pressure throughout the entire distribution system;
- Evaluated distribution system piping for high velocities and high head losses typically indicative of undersized piping as well as dead-end locations and hydraulic looping; and
- Evaluated the distribution system's ability to provide fire flows and maintain adequate residual pressures.

The model found that, in general, the pressures within the potable water system range from about 29 psi to 170 psi throughout the system under average day conditions. CDM Smith determined 86% of all model junctions have pressure within the acceptable range of 35 to 100 psi. Within the fire protection system, static pressure ranges from 130 to 180 psi.

The only locations where simulated pressures were at the lower end of the acceptable pressure range were the suction side of the pumps from the W-Lot reservoir and the immediate vicinity of the Towers standpipes. Because pumping water out of the W-Lot reservoir is sufficient to provide adequate pressure to refill the Towers standpipes, and because there are no customers served off of the suction side of the main, the simulated low pressures are not a concern. Similarly, the simulated low pressures in the immediate vicinity of the Towers standpipes are caused by the high elevations at these locations. Since there are no customers served in the immediate vicinity of the standpipes, these low simulated pressures are also not an immediate concern.

Based on the analysis conducted, the following conclusions were made regarding the adequacy of the existing system to meet current water system demands:

- The area within the domestic system with high pressure exceeding 100 psi, such as Towers Loop pressure zone, should be further evaluated to determine if the current control scheme can be changed or if pressure reducing valves need to be installed. Continued operation at high pressure may cause faucet leakage or hot water heater pressure relief valves to discharge, resulting in unnecessary water waste. Additionally, abnormally high pressure can result in excess water loss through system leakage and water main breaks.
- If future development is planned for the area in the north part of campus along Storrs Road (Route 195) near Horsebarn Hill Road and Tower Loop Road, provisions for individual water booster station(s) or the creation of a larger booster area should be included.
- Where possible, looping dead ends and replacing old unlined water mains will improve system capacity, water quality and reliability.
- Installing flow meters on all pumps and individual services to all buildings within the service area would assist with flow tracking.

Tables 4-15 summarizes the pipes in the hydraulic model by diameter.

TABLE 4-15
Breakdown of Transmission and Distribution System Model Pipes by Diameter

Diameter	Total Length (feet)
4-inch	4,116
6-inch	5,572
8-inch	39,966
10-inch	18,743
12-inch	26,557
14-inch	175
16-inch	37,995
20-inch	592
Total:	**133,716**

Overall, the modeling results indicate that UConn's distribution system reliably provides adequate distribution system pressure and there is not an urgent need for any pipeline replacement or new piping installations due to areas of low pressure or due to high head losses or velocities. However, with the model advanced to its present form, UConn is in a position to use it to help make decisions about the system such as prioritizing water main replacements.

More formalized model calibration and verification will be conducted in the future as time and budgetary considerations allow. A line item for future model calibration and verification has been listed in the Short-Term Improvement Schedule in Section 7.0.

4.6 Utility Design Criteria

The "Rules and Regulations of the University of Connecticut Water System" were adopted by the Board of Trustees and became effective October 1, 2006. Refer to Appendix N for a copy. The document provides policy and procedures for applications for new service, transfers of service, design and ownership of services, metering, billing, collections, termination of service, private fire service, and public fire protection service.

Although basic design criteria are set in the Rules and Regulations, the document does not include detailed design criteria that could be followed by a contractor for construction, installation, testing, and disinfection of pipes, valves, tapping sleeves, hydrants, and water service lines. NEWUS is available to assist in matters related to design criteria.

UConn is presently working on an update to the Rules and Regulations as the majority of off-campus customers are now the responsibility of CWC. The updated document may be combined with the sewer rules and regulations.

4.7 System Deficiencies and Needed Improvements

System deficiencies, where they exist, have been identified throughout the preceding sections. Detailed discussions of specific improvements designed to remediate these deficiencies, as well as those that will be necessary to meet future needs, are presented throughout this *2020 Plan* and are summarized in Section 7.0. Tables 7-8, 7-9, and 7-10 present system improvements in Short-Term, Intermediate-Term, and Long-Term Improvement Schedules.

A distribution system deficiency discussed in the *Emergency Contingency Plan* is that the Depot Campus portion of the system could benefit from increased source redundancy. If the Willimantic River Wellfield were compromised, it would be difficult to immediately flow water from the Fenton River Wellfield through the system and down to the Depot Campus. An item has been added to Table 7-9 to address the potential redundancy improvement.

5.0 SERVICE POPULATION AND HISTORICAL WATER USE

5.1 System Overview

UConn provides potable water for students, faculty, and staff at the Main Campus and nearby Depot Campus in Mansfield, Connecticut. The UConn transmission and distribution system has historically been installed on both state-owned lands and beneath certain roadways owned by the Town of Mansfield.

A small number of residents and businesses in the Storrs area are still served by the UConn water system, following completion of the CWC interconnection in 2016 that resulted in most non-UConn water users becoming CWC customers (see discussion in Section 3.2.4). Residents of Mansfield that live beyond water system service areas are served by private wells or by other small "community" public water systems that are independent from the UConn system.

Source water meters have been installed at the UConn water supply wells for several decades, and usage meters were originally installed in selected campus buildings in the early 1990s to track water consumption by major water users. Approximately 30 on-campus buildings were metered by 1999. Prior to completion of the CWC interconnection, Town of Mansfield facilities and select commercial users were also metered when they were part of the UConn water supply system, but most residential customers were not.

UConn embarked on an intensive metering program for both on-campus and off-campus water users beginning in 2006. The 2011 *Water Supply Plan* was the first UConn *Water Supply Plan* to present reasonable estimates of water usage by traditional user category, and this *2020 Plan* presents refined estimates based on additional metering completed between 2011 and 2019. Water users can be divided into on-campus and off-campus users and are therefore categorized as follows:

- <u>On-campus residential users</u>: This category includes UConn-owned residence halls and apartments on the UConn water system;
- <u>On-campus non-residential users</u>: This category includes transient visitors, non-transient commuting students, faculty, and staff; facilities usage; irrigation usage; the cooling towers, chillers, and boilers at the CUP; and the South Campus chillers.
- <u>Off-campus users</u>: This category includes residential, commercial, and institutional usage for the few remaining off-campus customers directly connected to the UConn water system.

Unlike many other community water systems, the population served by the UConn water system and its future growth are not proportional to population distribution and growth in the surrounding town (Mansfield). This is because UConn's primary interest lies in providing water to serve the needs of its students, faculty, visitors, facilities, and other support services. UConn previously committed to supplying a variety of off-campus users in the Town of Mansfield over the last four decades for several different reasons (some of which are listed in Section 2.1), however these areas now lie within the ESA of CWC and any additional service areas would be served by CWC if needed.

UConn has potential water demands described in Section 6.0 that include future on-campus buildings and to the potential growth of the student population. UConn does not anticipate directly serving additional off-campus customers in the future.

5.2 Historic Water Consumption

Historic water consumption data prior to 2007 is relatively poor due to limited metering. Older *Water Supply Plans* for UConn (through 2004) have necessarily assumed that water production was equivalent or close to water demand. This is not necessarily the case for the UConn water system, as water produced at the wells can go into storage and not reach an end user for several days.

As noted above, water demand categories are divided into on-campus residential, on-campus non-residential, and off-campus uses. These are described in more detail in the subsections below. Table 5-1 is a multi-page table that presents metered water usage by user category since 2000.

Prior to 2006, meters were read on a semi-annual basis. Monthly meter reading began in 2006 for on-campus connections, with the remaining off-campus connections read quarterly. Note that the 2006 data is limited to the last three months of the year, and the 2010 data represents a partial year. Note further that the residential demands in Table 5-1 have been summarized by complex (including any related dining hall demands). The residential complexes are described further in Section 5.2.1.

5.2.1 On-Campus Residential Users

According to the UConn Enrollment Office, the residential population of UConn at the Main Campus at the start of the 2018-2019 academic year was 12,296 people. This total includes undergraduate students and graduate students in UConn-owned residence halls and apartments.

Since the time of the last *Water Supply Plan* in 2011, several changes have occurred to on-campus housing:

- UConn purchased the Nathan Hale Inn in 2015 and used a portion of the rooms for student housing through the spring of 2019. The Inn is currently being renovated and will be used as a hotel operated by the firm "Graduate Hotels" in the future. It will no longer be available for student housing.
- Connecticut Commons (formerly the graduate student residences) closed in the spring of 2016. The facility was demolished and was replaced by the Student Recreation Center. It previously housed approximately 450 students. Northwoods Apartments is now prioritized for graduate student housing.
- The Peter J. Werth Residential Tower was constructed in the Hilltop area as part of the UConn NextGen Program and opened in 2016. This building has capacity for 725 students and resident assistants. The Putnam dining hall is closest to this building.
- Mansfield Apartments and Northwoods Apartments continue to be owned and operated by UConn, but water service is now provided by CWC.

Table 5-2 presents the resident population by housing complex. The 2018-2019 on-campus resident capacities are used as that period reflects the previous residential usage at Nathan Hale Inn.

Table 5-1
Metered Non-Residential Water Demands, 2011-2019
All Figures in gpd

Name	2011	2012	2013	2014	2015	2016	2017	2018	2019
Academic and Other Buildings									
Agriculture Biology, Lab & Greenhouse H2O Flow Bldg 0421	11,080	11,039	13,133	12,267	17,883	13,570	10,754	9,541	9,676
Admission Bldg H20 Flow	N/A	413	520	40,433	466	311	298	330	340
Alumni House	0	285	317	232	296	658	264	285	267
Atwater Laboratory H20 Flow Bldg 0040	1,280	1,028	1,055	807	681	447	530	670	16,258
Babbage Library H20 Flow	19,446	12,562	7,547	8,080	8,851	14,286	6,643	N/A	N/A
Beach Hall H20 Flow Bldg 0038	9,064	5,789	5,294	6,095	6,247	6,234	2,966	3,060	2,795
Benton Museum of Art H20	3	241	346	295	476	706	374	336	N/A
Biobehavioral 4 Original Prefab Bldg 1101A	1,164	1	N/A	N/A	319	326	210	225	199
Bio4 H20 Flow	286	10	N/A	N/A	75	80	202	156	147
BioPhysics H20 Flow Bldg 0384	6,245	5,655	3,703	4,137	4,478	11,004	6,146	6,042	5,430
Bishop Center H20 Flow		600	574	681	1,068	3,359	1,203	629	644
Castleman H20 Flow	1,306	1,215	1,151	142	142	121	85	N/A	N/A
Center UnderGrad H20	1,067	1,104	993	1,030	1,135	1,228	1,246	1,353	1,261
Chemistry H2O Flow Bldg 0409	978	4,951	12,560	7,130	5,454	3,516	3,466	3,219	3,828
CHIPS Ryan Refectory	568	640	887	281	859	1,009	450	462	319
College of Liberal Arts & Science H20 Flow Bldg 0238	1,143	1,171	1,267	1,223	1,297	1,193	1,199	1,265	1,302
Commisary Bakery & Warehouse H20 Flow Bldg 0244	1,386	1,140	589	2,938	15	0	N/A	N/A	N/A
Dodd H20		2,017	2,099	2,966	2,124	2,290	1,822	2,163	1,821
Drama Music H20		2,524	1,305	1,371	1,876	857	1,162	1,356	1,387
Engineering 2 H20 Flow Bldg 0239	14,748	9,458	8,224	9,012	8,834	9,094	3,817	N/A	N/A
Engineering 3 - Arthur Bronwell Building - H20 Flow	6,441	4,359	738	490	493	1,740	496	N/A	N/A
Floriculture H20		19	15	36	40	44	13	9	8
Gulley Hall H20	289	307	267	230	271	320	293	257	210
Human Development H20			827	851	865	741	703	812	766
IMS (Now Gant North) H20 Flow Bldg 0331A	19,108	14,913	14,392	19,808	17,927	16,624	18,561	15,676	N/A
ITEB H20 Flow Bldg 0434	1,266	1,447	1,294	1,542	2,053	1,198	2,258	2,010	2,369
Jones Building H20 Flow Bldg 0240	4,707	11,402	795	1,584	1,265	461	1,402	326	1,213
Lakeside H20	165	149	141	149	184	152	12	N/A	N/A
Laurel (Now McHugh) Hall (West Classroom) H20		879	1,007	1,121	1,568	950	1,135	1,099	991
Museum of Natural History H20 Flow Bldg 0030	30	35	36	60	205	44	39	53	74
Music Building H20		673	1,270	N/A	526	429	592	607	567
Music Orchestra H20		146	208	N/A	524	583	330	350	151
Nathan Hale Inn - UConn Metering	9,373	11,364	9,264	10,496	*Now Under Residential*				
Neag/Gentry H20		947	1,155	1,219	1,142	1,101	1,160	1,176	1,122
New Fine Arts H20		50	833	245	2,199	409	399	519	666
Oak Hall (East Classroom) H20			1,427	1,460	1,588	1,933	1,781	1,667	1,562
Pharmacy/Biology H20 Flow Bldg 0415	25,049	24,961	19,427	159,421	66,900	42,070	39,021	53,189	57,871
Physics Gant Complex (Physics Build, MSB) H20 Flow Bldg 0331C	23,912	23,439	10,631	8,099	9,444	17,282	21,829	N/A	N/A
Psychology Bousfield H20 Flow Bldg 0349	14,241	10,100	4,149	N/A	2,098	3,471	3,782	4,499	4,561
Public Safety H20		575	646	663	688	947	690	656	662
School of Business H20	1,266	1,736	1,858	2,356	2,636	1,985	1,472	1,583	1,469
Storrs Hall Domestic H20	23	11	N/A	N/A	4	1	4	1	N/A

Table 5-1
Metered Non-Residential Water Demands, 2011-2019
All Figures in gpd

Name	2011	2012	2013	2014	2015	2016	2017	2018	2019
Torrey Life Science H20 Flow Bldg 0252	13,775	15,871	17,230	32,774	12,776	11,529	6,440	5,307	4,236
Total Student Union Including Vendors	15,725	16,506	15,798	17,134	19,952	19,264	12,428	11,381	10,759
Old UConn Co-Op to 2003; New Co-Op and South Garage	1,244	1,244	1,143	1,362	1,263	997	984	1,083	924
UConn Foundation	1,312	1,541	1,474	633	818	545	1,147	686	962
United Technologies Engineering Building H20 Flow Bldg 0369	4,534	1,630	1,690	1,396	1,805	1,855	191	N/A	N/A
Visitors Center H20		78	1,099	1,607	779	635	442	757	988
Whetten Graduate Center H20	437	733	752	764	802	658	584	670	543
White Dairy Building H20 Flow Bldg 0222	2,859	4,557	3,816	2,818	3,783	4,390	2,691	1,686	2,841
Wilbur Cross H20	1,395	1,620	1,497	1,384	1,765	1,299	1,386	935	1,372
Williams Health Services Infirmary H2O Flow Bldg 0171	534	634	888	1,364	3,429	816	648	657	723
Wood Hall H20 Flow Bldg 0131	1,254	342	378	348	318	348	467	335	310
Young Building H20 Flow Bldg 0175	2,028	1,019	N/A	595	864	816	838	843	849
Athletics									
Batting and Pitching Facility H20 Flow Bldg 0406	53	56	36	N/A	15	0	N/A	1	N/A
Burton Football & Shenkman H20 Flow Bldg 0480	45,744	53,905	14,726	10,627	9,555	3,199	4,639	4,546	1,448
Field House H20	11,371	5,875	5,425	5,801	5,804	6,370	6,044	6,249	4,555
Gampel Pavilion Sports Center H2O Flow Bldg 0374	7,463	9,717	8,274	7,231	4,670	4,489	3,996	533	14,293
Ice Rink Arena H20 Flow Bldg 0433	3,287	3,456	4,433	3,818	3,511	4,222	3,638	3,175	3,419
Soccer Field Bldg 530SW	0	0	0	N/A	N/A	0	N/A	1	2
Soccer Practice Field	0	0	1	0	N/A	0	N/A	0	N/A
Utilities									
Cogeneration Chiller Facility H2O Flow Bldg 0483									
CUP Heating and Power Plant H2O Flow Bldg 0141									
CUP RO System Inlet									
Total CUP	400,433	303,049	321,277	102,312	153,195	107,060	97,321	133,699	N/A
RWF Fresh Water Use					56,773	91,158	92,342	84,573	N/A
Waste Water Control Building H20 Flow Bldg 0388	311	243	163	285	177	174	185	139	150
Waste Water: Odor Control H20 Flow Bldg 0389	23,177	16,310	6,939	6,621	1,935	2,649	2,790	2,871	2,591
Waste Water: Process H20 Flow Bldg 0390	12	6	N/A	N/A	N/A	28	22	0	N/A
Depot Campus									
Depot Campus Kennedy Cottage H2O Flow Bldg 2131	81	135	77	85	89	201	124	95	96
Depot Campus Longley School H20 Flow Bldg 1125	119	217	280	277	283	452	478	773	927
Depot Campus Mansfield Cottage H20 Flow Bldg 2138									
Depot Campus Coventry Cottage H20 Flow Bldg 2112	53	2	N/A	54	15	9	N/A	0	N/A
Enterprise H20 Flow (Depot Campus)	308	514	538	394	265	306	250	201	175

TABLE 5-2
Main Campus Resident Population and Water Demand, 2019

Name	Year Built	Dining Hall	2018-2019 Capacity (Estimated Population)[1]	Typical Usage 2011-2019, gpd	Per-Capita Demand, gpcd[2]
Alumni Quadrangle	1966	None	965	22,700	23.5
Buckley Hall	1969	Full Service	390	15,700	40.3
Busby Suites	2003	Kitchens	491	16,000	32.6
Charter Oak Apartments	2003	Kitchens	620	21,700	35.0
East Campus	1922 – 1950	Full Service	562	20,900	37.2
Garrigus Suites	2001	Kitchens	478	15,500	32.4
Greek Campus / Husky Village	2004	Kitchens	300	7,600	25.3
Hilltop Apartments	2001	Kitchens	1,077	34,000	31.6
Hilltop Complex (Ellsworth, Hale)	1971	Full Service	560	20,000	35.7
McMahon Hall	1964	Full Service	602	34,200	56.8
Nathan Hale Inn	2001	None	150	10,400	69.3
North Campus	1950	Full Service	1,318	67,900	51.5
Northwest Quadrangle	1950; Renov. 1999	Full Service	1,022	22,000	21.5
Shippee Hall	1962	None	295	8,300	28.1
South Campus	2000	Full Service	657	18,900	28.8
Towers Quadrangle	1960 & 2003	Full Service	937	28,200	30.1
Werth Tower[3]	2016	None	725	21,800	30.0
West Campus	1955	None	484	12,300	25.4
		Total for UConn Water System[4]:	***11,633***	***417,700***	***34.7***

1. Capacity includes assigned room spaces for students and resident assistants. It does not include hall directors or their families who typically live in an apartment at each complex.
2. Per-capita demand based on the Typical Usage from 2011 to 2019 (gpd) divided by the 2018-2019 capacity, assuming occupancy is 100% of capacity. Note that occupancy is typically near 100% but varies from semester to semester and also from year to year.
3. Flows for Werth Tower estimated as meter is not yet functional.
4. Does not include Mansfield Apartments, Northwoods Apartments, or other off-campus residential buildings that are now served by CWC.

All housing complexes are metered and are nearly 100% occupied for the majority of the year. According to UConn Residential Life, slightly fewer students are typically present during the spring semester than the fall semester due to students studying abroad, transfers, mid-year graduations, and dropouts.

Per capita water use for on-campus residential users was determined to be 34.7 gallons per capita per day (gpcd) based on the average of metered residential water use from 2011 to 2019 (an average of 417,700 gpd). This figure is comparable to the 32.6 gpcd presented in the 2011 *Water Supply Plan*. The per-capita demand figure is low compared to typical community water systems where per-capita consumption varies from approximately 45 gpcd to 75 gpcd, but reasonable for on-campus student housing where laundry, dining, and restroom facilities are shared and outdoor water uses are lacking.

Note that most of the per-capita figures presented above are skewed slightly lower by the averaging that occurs when comparing annual consumption to a population that is largely absent from late May through late August. However, demand trends over the last 5 to 10 years have begun to ramp up in July and August as a result of summer programs at UConn. Note further that UConn has identified the potential for expansion of on-campus housing in the foreseeable future as presented in Section 6.3.1.

5.2.2 On-Campus Non-Residential Users

The on-campus, non-residential population served by UConn is significant. The non-transient, non-residential populations include the pre-school children at the Child Development Lab (which was metered in 2019), the many faculty and staff (estimated at 4,600 people for the Storrs Campus), and the undergraduate and graduate students who live off-campus (estimated to be 10,800 in 2019).

The transient non-residential population includes the many visitors that come for on-campus tours (estimated by the Visitor's Center at 50,000 per year) and those who attend sporting events at Gampel Pavilion or other athletic stadiums. Additionally, other campus venues offer year-round programming to attract off campus visitors, including the Harriet S. Jorgensen Theatre, and the J. Louis von der Mahden Recital Hall, among others. The total transient population attending such functions at UConn is easily greater than 100,000 individual visits per year.

At this time, 67 of the approximately 170 buildings on the Main Campus are metered. The metered uses include the majority of the high water-demand users on campus, so applying an average usage based on the high demand users to the remaining unmetered buildings would be meaningless. Thus, it is impossible at this time to precisely estimate the water usage in the unmetered non-residential buildings. However, UConn’s metering program has been updating and replacing certain older meters to meet the current UConn metering standard (Section 4.2.6). Approximately 35 building locations were updated by December 2019. The remaining buildings will be metered as indicated by the improvement schedules listed in Section 7.0 based on the metering program in Section 4.2.6.

The 71 metered on-campus non-residential users (including 4 on the Depot Campus) can be broken down into four subcategories as shown in Table 5-3.

TABLE 5-3
On-Campus Non-Residential Water Usage

Subcategory	Number of Metered Connections	Typical 2011 to 2019 Usage, gpd
Academic, Administrative, and other Buildings	55	214,317
Athletics Buildings	7	35,480
Utilities (CUP, Chillers, RWF, WPCF)	5	215,034
Depot Campus	4	903
Total On-Campus Non-Residential Metered Usage:		***465,734***

Most of the users of the UConn water system exhibit a seasonality to their consumption patterns that is closely linked to the academic schedule. However, the CUP demands follow a modified seasonality pattern that is closely related to the heating and cooling needs. Heating and cooling needs are somewhat dependent on population but are very much affected by the temperature and season.

Daily water consumption at the CUP includes makeup water for chilled water, the cooling towers, and the boilers, with the majority of this demand being met with reclaimed water (approximately 90%). The CUP includes the pre-1960s Boiler Plant, the 1998 Chiller Plant and #9 Boiler, and the Co-Generation Plant with three gas turbines and adsorption chillers. The cooling towers cool water by evaporation and typically evaporate 60 to 70% of the incoming water, with the balance being returned to the sanitary sewer to prevent the buildup of excess solids in the system. Makeup water is needed for boilers to replace steam losses from leaks, steam traps, and humidification systems and to replace water that has been lost in the steam line condensate return system.

Table 5-4 provides a comparison of metered makeup water demands to potable water production in the year 2011. Table 5-5 presents a similar table for the year 2018. The two years provide contrast between previous operations and current operations, with the amount of potable makeup water being used essentially being reduced by two-thirds with the RWF online.

TABLE 5-4
Summary of Makeup Water Consumption at Central Utilities Plant, 2011

Month	Wellfield Production (gallons)	Total CUP Use (gallons)	% of Production Used at CUP
Jan.	38,314,800	7,999,000	21%
Feb.	45,601,100	7,463,000	16%
Mar.	44,920,000	7,580,000	17%
Apr.	44,731,100	7,283,000	16%
May	29,314,300	6,375,000	22%
Jun.	27,446,000	15,685,000	57%
Jul.	32,550,400	**19,897,000**	**61%**
Aug.	35,879,200	18,256,000	51%
Sep.	**48,615,400**	16,724,000	34%
Oct.	46,298,900	12,946,000	28%
Nov.	40,916,500	12,498,000	31%
Dec.	37,209,300	13,452,000	36%
Year	471,797,000	146,158,000	31%

Note: Peak numbers in each category are shown in bold text.

TABLE 5-5
Summary of Makeup Water Consumption at Central Utilities Plant, 2018

Month	Wellfield Production (gallons)	Total Potable CUP Use (gallons)	% of Potable Production Used at CUP	RWF Production (gallons)	Total Non-Potable CUP Use (gallons)	% of RWF Production Used at CUP
Jan.	23,764,000	1,903,000	5%	11,258,919	11,042,369	98%
Feb.	**38,112,000**	2,038,000	4%	8,924,647	8,702,924	98%
Mar.	26,259,000	1,948,000	4%	9,904,007	8,830,942	89%
Apr.	30,190,000	4,094,000	9%	7,397,623	6,835,468	92%
May	19,963,000	4,943,000	17%	3,600,932	3,117,225	87%
Jun.	18,160,000	4,311,000	16%	7,643,286	7,101,746	93%
Jul.	21,456,000	5,447,000	17%	**12,303,901**	11,454,120	93%
Aug.	26,742,000	**9,242,000**	**26%**	10,875,861	10,033,796	92%
Sep.	30,684,000	6,033,000	12%	10,834,525	10,076,043	93%
Oct.	28,729,000	3,160,000	7%	10,934,197	10,195,148	93%
Nov.	23,981,000	3,277,000	8%	7,299,340	7,299,340	100%
Dec.	19,089,000	2,404,000	6%	9,293,780	8,701,636	94%
Year	307,129,000	48,800,000	16%	110,271,018	103,390,757	94%

Note: Peak numbers in each category are shown in bold text.

The boiler makeup demand reaches its peak during the heating season, whereas cooling tower makeup water demands are at their peak when the temperatures are warmest. Overall, the percentage of potable wellfield withdrawals that are directed to the CUP for makeup water now typically ranges from 5% to 26% per month based on the 2018 data.

It is notable that the overall peak month for water production (typically September in any given year) does not coincide with the peak months of CUP makeup water consumption. This is because water usage by the UConn population drives the peak demands when the fall semester begins. Nevertheless, the cooling tower demands are significant in September, and they are an important fraction of overall water usage during that month.

The percentages in Table 5-5 for the percentage of RWF production used at the CUP is not 100% because there are other uses of reclaimed water connected to the RWF. These include toilet flushing at the ESB and the IPB. These grey water uses are not metered, but nevertheless contribute to a potable water demand reduction at those facilities.

Flows leaving the RWF into the grey water system are metered. Monthly flows to the RWF storage tank are presented in Table 5-6. Flows have averaged from 0.24 mgd to 0.33 mgd over the seven years of operation, resulting in reduced potable water demands of a similar volume. Peak day grey water flow into the system was 0.651 MG in March 2017.

TABLE 5-6
Monthly RWF Flows to the Campus Grey Water System

Month	2013 Flows (mgd)	2014 Flows (mgd)	2015 Flows (mgd)	2016 Flows (mgd)	2017 Flows (mgd)	2018 Flows (mgd)	2019 Flows (mgd)
Jan.	N/A	0.219	0.099	**0.407**	0.363	0.363	0.312
Feb.	N/A	**0.334**	0.245	0.384	0.351	0.319	0.296
Mar.	N/A	0.175	**0.344**	0.404	**0.410**	0.319	0.310
Apr.	N/A	0.320	0.316	0.376	0.313	0.247	0.296
May	N/A	0.117	0.095	0.159	0.139	0.116	0.268
Jun.	N/A	0.119	0.247	0.224	0.251	0.255	0.387
Jul.	0.394	0.270	0.336	0.339	0.318	**0.397**	**0.453**
Aug.	**0.555**	0.256	0.293	0.345	0.384	0.351	0.420
Sep.	0.331	0.250	0.262	0.311	0.298	0.361	0.423
Oct.	0.376	0.270	0.083	0.140	0.368	0.353	0.356
Nov.	0.235	0.275	0.223	0.202	0.365	0.243	0.190
Dec.	0.279	0.252	0.342	0.368	0.372	0.300	0.331
Year	0.316	0.238	0.240	0.305	0.320	0.302	0.334

Note: Peak monthly flows for each year are shown in bold text.

5.2.3 Off-Campus Users

UConn previously served approximately 115 residential structures that (1) were not group quarters; and (2) were considered off-campus, even though some of these buildings were owned by UConn. Furthermore, UConn previously served seven off-campus residential complexes as well as a variety of off-campus commercial and institutional uses. After completion of the CWC interconnection in 2016, nearly all off-campus buildings became customers of CWC and are no longer served by the UConn water supply system. Streets that were formerly served include:

- Main Campus Area: Dog Lane, Eastwood Road, Gurleyville Road, Hillside Circle, Hunting Lodge Road, Meadowood Road, Moulton Road, North Eagleville Road, Oak Hill Road, Separatist Road, South Eagleville Road, Westwood Road, and Willowbrook Road, for a total of 106 connections; and,

- Depot Campus Area: Old Colony Road, Spring Manor Lane, and Stafford Road (Route 32), for a total of nine connections.

UConn continues to serve a minimal number of off-campus customers that were not transferred to CWC under the 2013 agreement. These include the following:

- Residence – 4 Moulton Road (metered), typical use of 120 gpd
- Saint Mark's Chapel – 42 North Eagleville Road (metered), typical use of 100 gpd
- Saint Thomas Aquinas Chapel – 46 North Eagleville Road (metered), typical use of 100 gpd
- Saint Thomas Aquinas Residence – 46 North Eagleville Road (metered), typical use of 150 gpd
- Hillel House - 54 North Eagleville Road (metered), typical use of 100 gpd
- Frontier Communications – 1298 Storrs Road (metered), typical use of 20 gpd
- Residence - 64 Spring Manor Lane – (metered), typical use of 190 gpd

- Residence – 66 Spring Manor Lane – (metered), typical use of 140 gpd
- Tri-County Greenhouse – 290 Middle Turnpike (metered), typical use of 700 gpd

Thus, the remaining off-campus users (total of 1,620 gpd) comprise negligible percentage of the total demand on the UConn water system.

5.2.4 Summary of Known Water Usage

The water consumption figures presented in Section 5.2.1 through 5.2.3 are summarized in Table 5-7.

TABLE 5-7
Service Population and Water Usage by Category, 2011-2019

Name	2019 Population	Typical Usage, 2011 to 2019 (gpd)
On-Campus Residential	11,633	417,700
On-Campus Non-Residential	N/A	465,734
Off-Campus	15	1,620
Total:	**11,648**	**885,054**

Note: Does not include unmetered demands.

As discussed in the next two sections, water demands on the UConn water system have significantly decreased since 2011 due to the construction of the RWF and the completion of the CWC interconnection that shifted responsibility for serving most former off-campus customers to CWC.

Table 5-8 summarizes the top ten UConn water users. An understanding of the highest water users is an important component of water conservation. The *Water Conservation Plan* further addresses the top users.

TABLE 5-8
Top Ten UConn Potable Water Users

Name	Type or Use	Typical Usage 2011-2019, gpd*	Per-Capita Demand, gpcd
Central Utility Plant	Utility	119,000	N/A
RWF Fresh Water Usage	Utility	87,900	N/A
Pharmacy / Biology Building	Academic / Research	54,200	N/A
North Campus	Residential / Dining	67,900	51.5
McMahon Hall	Residential / Dining	34,200	56.8
Hilltop Apartments	Residential	34,000	31.6
Towers Quadrangle	Residential / Dining	28,200	30.1
Alumni Quadrangle	Residential	22,700	23.5
Northwest Quadrangle	Residential / Dining	22,000	21.5
Charter Oak Apartments	Residential	21,700	35.0

*List does not include buildings with estimated flows.

5.3 Historic Water Production

Table 5-9 summarizes the annual water production from the Fenton River Wellfield and the Willimantic River Wellfield since 1984. All data are based upon UConn production records. Note that UConn has not yet made any purchases of water through the CWC interconnection, so the annual water production from the wellfields continues to represent 100% of UConn's water production.

TABLE 5-9
Summary of Annual Production

Year	Average Daily Production (mgd)	Year	Average Daily Production (mgd)
1984	1.21	2002	1.26
1985	1.08	2003	1.29
1986	1.36	2004	[not available]
1987	1.35	2005	1.49
1988	1.57	2006	1.36
1989	1.61	2007	1.29
1990	1.54	2008	1.26
1991	1.54	2009	1.23
1992	1.48	2010	1.29
1993	1.31	2011	1.29
1994	1.37	2012	1.26
1995	1.37	2013	1.10
1996	1.30	2014	1.16
1997	1.13	2015	1.19
1998	1.17	2016	1.04
1999	1.22	2017	0.90
2000	1.22	2018	0.75
2001	1.28	2019	0.72

It is well-documented that system demand is higher during the fall and spring semesters and lower when the majority of students are on breaks. Monthly historical demand values are presented in Table 5-10 and ADD by month is presented in Table 5-11. PDD by month is presented in Table 5-12. All three tables are presented below.

As seen in Table 5-10 and Table 5-11, monthly water production has historically peaked in April and October. Since 2002, monthly water production has generally peaked in September, except for 2012 and 2013 when production peaked in April, and 2016 and 2018 when production peaked in February; these peak months coincide with the return of students to campus from various breaks and/or when chiller use begins to ramp up during warmer spring seasons. The highest average day monthly water production in the past several years occurred in September of 2005, when the average daily demand was 1.95 mgd. Since this peak, September water demands from 2006 through 2018 have been decreasing steadily from approximately 1.3 mgd in 2006 to 2011, to approximately 1.0 to 1.1 mgd for the last three years (2017 to 2019). The September demand is critical because it occurs during the typical low-flow periods in the two rivers adjacent to the UConn wellfields.

Table 5-10
Monthly Water Production (MG)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average Daily Demand (MGD)
1984*	30.75	42.09	38.11	42.20	33.94	27.53	28.06	30.67	43.28	**48.36**	41.05	36.42	442.46	1.21
1985	30.93	39.60	38.71	**42.74**	33.55	25.76	27.36	28.49	35.63	30.44	34.92	26.79	394.92	1.08
1986	38.11	44.93	43.44	47.43	37.25	29.9	39.33	30.58	48.12	**49.76**	46.92	42.07	497.84	1.36
1987	33.28	43.67	44.17	45.66	39.3	30.78	35.47	33.65	47.62	**50.16**	44.48	43.08	491.32	1.35
1988*	42.47	52.54	51.02	54.10	45.27	38.95	41.01	42.37	53.93	**54.99**	48.76	50.10	575.51	1.57
1989	43.48	50.40	49.52	54.50	47.41	39.23	41.81	41.75	55.31	**57.78**	53.00	52.56	586.75	1.61
1990	43.23	50.34	49.55	52.77	44.63	40.09	39.11	39.64	51.86	**54.37**	48.35	48.46	562.40	1.54
1991	46.06	48.86	47.25	50.63	42.27	39.34	39.87	37.93	53.88	**57.58**	49.47	48.32	561.46	1.54
1992*	41.68	50.92	52.02	**54.05**	44.09	40.60	36.68	36.46	48.27	51.21	45.77	41.35	543.10	1.48
1993	36.07	42.12	43.42	**45.23**	37.01	32.12	36.40	36.10	44.99	43.37	42.05	40.22	479.10	1.31
1994	37.93	41.90	45.78	46.79	40.71	34.63	37.07	35.48	45.71	**46.86**	43.59	44.88	501.33	1.37
1995	41.63	46.06	44.52	**47.72**	43.95	35.07	38.37	35.41	43.60	45.55	40.38	38.52	500.78	1.37
1996*	32.61	46.57	45.52	**48.47**	40.31	33.42	37.84	33.36	44.07	41.05	39.19	33.60	476.01	1.30
1997	24.57	35.48	37.22	**43.26**	32.91	29.90	30.87	30.74	40.65	40.42	35.20	30.74	411.96	1.13
1998	30.93	34.15	34.12	40.50	31.10	24.73	34.02	30.00	41.95	**50.04**	38.84	35.96	426.34	1.17
1999	37.20	37.47	37.99	42.44	32.05	28.62	33.55	30.65	44.06	**47.42**	38.08	36.68	446.21	1.22
2000*	30.30	38.01	36.53	40.44	33.47	25.37	27.19	35.77	47.77	**48.54**	42.39	42.02	447.80	1.22
2001	29.55	42.07	40.96	43.84	38.04	30.55	30.97	38.10	40.59	**50.89**	43.75	36.82	466.13	1.28
2002	34.33	41.11	38.80	44.15	37.30	27.85	32.72	36.35	**45.58**	42.36	39.31	38.60	458.46	1.26
2003	37.17	43.06	41.81	44.38	38.76	32.19	35.18	37.58	**45.90**	43.99	37.30	31.91	469.23	1.29
2004*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2005	43.33	46.52	46.84	49.82	38.00	40.16	42.35	51.01	**58.35**	48.27	38.76	38.94	542.35	1.49
2006	36.98	42.96	44.28	45.68	33.49	32.43	42.52	45.07	**49.68**	49.19	41.93	33.66	497.85	1.36
2007	37.54	42.90	40.21	44.37	33.24	33.96	37.36	40.34	**46.69**	45.35	36.60	31.99	470.54	1.29
2008*	35.26	46.23	38.77	43.23	30.68	32.61	36.00	36.30	**47.74**	44.91	37.83	33.09	462.65	1.26
2009	34.97	40.08	39.58	42.97	32.97	27.73	29.44	35.85	**47.37**	44.76	37.37	37.28	450.37	1.23
2010	36.73	39.90	38.77	45.85	31.77	30.68	35.27	36.04	**49.29**	47.10	40.23	39.49	471.12	1.29
2011	38.31	45.60	44.92	44.73	29.31	27.45	32.55	35.88	**48.62**	46.30	40.92	37.21	471.80	1.29
2012*	38.99	43.62	44.44	**46.01**	30.86	30.49	34.80	35.24	45.20	44.32	37.33	31.46	462.75	1.26
2013	34.04	40.48	39.68	**42.28**	29.57	22.98	24.52	31.81	38.94	37.08	32.27	26.18	399.82	1.10
2014	33.48	36.54	41.11	41.52	30.46	27.42	27.91	32.47	**43.22**	42.75	35.82	29.10	421.80	1.16
2015	34.84	41.49	39.69	41.21	33.74	25.98	31.66	29.78	42.97	**44.77**	34.49	32.87	433.50	1.19
2016*	33.47	**39.11**	35.79	37.76	27.17	24.39	26.59	29.69	38.99	38.77	27.98	22.17	381.88	1.04
2017	26.41	31.11	29.63	33.67	23.11	23.05	25.83	28.28	**35.59**	29.78	21.94	19.11	327.50	0.90
2018	21.85	20.89	23.77	28.71	18.64	17.68	20.87	25.86	**29.60**	26.82	22.52	17.35	274.56	0.75
2019	16.97	24.07	24.23	26.21	17.12	13.79	20.47	24.89	**31.36**	28.68	20.74	15.52	264.04	0.72

Notes: NA = Not Available.

* = Leap year. Average Daily Demand calculation is over 366 days.

Bold values = highest production month for that year.

Table 5-11
Monthly Water Production (MGD) - Average Daily Demand

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Maximum Month Average Daily Demand
1984	0.99	1.45	1.23	1.41	1.09	0.92	0.91	0.99	1.44	**1.56**	1.37	1.17	1.56
1985	1.00	1.41	1.25	**1.42**	1.08	0.86	0.88	0.92	1.19	0.98	1.16	0.86	1.42
1986	1.23	1.60	1.40	1.58	1.20	1.00	1.27	0.99	1.60	**1.61**	1.56	1.36	1.61
1987	1.07	1.56	1.42	1.52	1.27	1.03	1.14	1.09	1.59	**1.62**	1.48	1.39	1.62
1988	1.37	**1.81**	1.65	1.80	1.46	1.30	1.32	1.37	1.80	1.77	1.63	1.62	1.81
1989	1.40	1.80	1.60	1.82	1.53	1.31	1.35	1.35	1.84	**1.86**	1.77	1.70	1.86
1990	1.39	**1.80**	1.60	1.76	1.44	1.34	1.26	1.28	1.73	1.75	1.61	1.56	1.80
1991	1.49	1.75	1.52	1.69	1.36	1.31	1.29	1.22	1.80	**1.86**	1.65	1.56	1.86
1992	1.34	1.76	1.68	**1.80**	1.42	1.35	1.18	1.18	1.61	1.65	1.53	1.33	1.80
1993	1.16	1.50	1.40	**1.51**	1.19	1.07	1.17	1.16	1.50	1.40	1.40	1.30	1.51
1994	1.22	1.50	1.48	**1.56**	1.31	1.15	1.20	1.14	1.52	1.51	1.45	1.45	1.56
1995	1.34	**1.65**	1.44	1.59	1.42	1.17	1.24	1.14	1.45	1.47	1.35	1.24	1.65
1996	1.05	1.61	1.47	**1.62**	1.30	1.11	1.22	1.08	1.47	1.32	1.31	1.08	1.62
1997	0.79	1.27	1.20	**1.44**	1.06	1.00	1.00	0.99	1.36	1.30	1.17	0.99	1.44
1998	1.00	1.22	1.10	1.35	1.00	0.82	1.10	0.97	1.40	**1.61**	1.29	1.16	1.61
1999	1.20	1.34	1.23	1.41	1.03	0.95	1.08	0.99	1.47	**1.53**	1.27	1.18	1.53
2000	0.98	1.31	1.18	1.35	1.08	0.85	0.88	1.15	**1.59**	1.57	1.41	1.36	1.59
2001	0.95	1.50	1.32	1.46	1.23	1.02	1.00	1.23	1.35	**1.64**	1.46	1.19	1.64
2002	1.11	1.47	1.25	1.47	1.20	0.93	1.06	1.17	**1.52**	1.37	1.31	1.25	1.52
2003	1.20	**1.54**	1.35	1.48	1.25	1.07	1.13	1.21	1.53	1.42	1.24	1.03	1.54
2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2005	1.40	1.66	1.51	1.66	1.23	1.34	1.37	1.65	**1.95**	1.56	1.29	1.26	1.95
2006	1.19	1.53	1.43	1.52	1.08	1.08	1.37	1.45	**1.66**	1.59	1.40	1.09	1.66
2007	1.21	1.53	1.30	1.48	1.07	1.13	1.21	1.30	**1.56**	1.46	1.22	1.03	1.56
2008	1.14	1.59	1.25	1.44	0.99	1.09	1.16	1.17	**1.59**	1.45	1.26	1.07	1.59
2009	1.13	1.43	1.28	1.43	1.06	0.92	0.95	1.16	**1.58**	1.44	1.25	1.20	1.58
2010	1.18	1.43	1.25	1.53	1.02	1.02	1.14	1.16	**1.64**	1.52	1.34	1.27	1.64
2011	1.24	**1.63**	1.45	1.49	0.94	0.91	1.05	1.16	1.62	1.49	1.36	1.20	1.63
2012	1.26	1.50	1.43	**1.53**	0.99	1.02	1.09	1.14	1.51	1.43	0.12	1.01	1.53
2013	1.10	**1.45**	1.28	1.41	0.95	0.77	0.79	1.02	1.30	1.19	1.08	0.84	1.45
2014	1.08	1.31	1.32	1.38	0.98	0.91	0.90	1.05	**1.44**	1.38	1.19	0.94	1.44
2015	1.12	**1.48**	1.28	1.37	1.09	0.87	1.02	0.96	1.43	1.44	1.15	1.06	1.48
2016	1.08	**1.35**	1.15	1.26	0.88	0.81	0.86	0.96	1.30	1.25	0.92	0.71	1.35
2017	0.84	1.05	0.96	1.12	0.76	0.76	0.78	0.89	**1.15**	0.93	0.71	0.71	1.15
2018	0.77	**1.36**	0.85	1.01	0.64	0.61	0.69	0.86	1.02	0.93	0.80	0.62	1.36
2019	0.57	0.88	0.81	0.89	0.57	0.52	0.75	0.80	**1.06**	0.94	0.76	0.51	1.06

Notes: NA = Not Available.
Bold values = highest production month for that year.

Table 5-12
Peak Day Production (MGD)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Maximum Peak Day Demand
1988	2.09	2.36	2.50	2.39	2.40	1.83	2.56	1.92	2.25	**2.56**	2.19	2.53	2.56
1989	2.25	**2.85**	2.24	2.56	2.41	1.54	1.79	1.71	2.61	2.35	2.61	2.74	2.85
1990	2.02	2.24	1.94	2.37	1.96	1.85	1.64	1.62	**2.62**	2.05	2.07	2.50	2.62
1991	2.06	1.97	2.00	2.03	1.90	2.10	1.75	1.73	2.07	**2.42**	2.05	2.22	2.42
1992	1.97	2.08	2.17	**2.43**	2.22	2.30	1.46	1.76	2.07	2.23	1.82	2.04	2.43
1993	1.73	1.79	1.81	1.98	1.79	**2.26**	2.04	1.81	2.16	1.85	2.10	1.81	2.26
1994	1.99	1.86	2.00	2.06	1.95	1.47	1.69	1.44	**2.20**	1.84	1.90	2.06	2.20
1995	1.77	1.94	1.81	1.90	**1.97**	1.37	1.63	1.49	1.73	1.73	1.60	1.70	1.97
1996	1.75	2.02	1.83	**2.04**	1.80	1.36	1.59	1.58	1.93	1.68	1.87	1.67	2.04
1997	1.30	1.53	1.66	**1.75**	1.60	1.29	1.57	1.47	1.63	1.58	1.53	1.47	1.75
1998	1.58	1.46	1.60	1.99	1.94	1.25	1.73	1.54	1.78	**2.02**	1.82	1.58	2.02
1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.13**	NA	NA	2.13
2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2006	2.19	2.05	2.01	1.89	1.76	**2.40**	2.13	2.03	2.09	1.86	2.01	1.64	2.40
2007	**1.98**	1.94	1.96	1.80	1.82	1.70	1.69	1.80	1.97	1.88	1.90	1.64	1.98
2008	1.82	2.04	1.84	1.93	1.70	1.90	1.72	**2.33**	2.05	1.84	2.14	1.73	2.33
2009	1.86	1.85	1.45	1.93	1.78	1.48	1.24	1.83	2.11	1.72	**2.16**	2.01	2.16
2010	1.68	1.73	**2.23**	2.03	1.68	1.46	1.93	2.02	2.12	2.02	1.89	1.97	2.23
2011	1.91	2.08	2.02	1.89	1.46	1.44	1.55	2.12	1.92	**2.30**	2.00	1.83	2.30
2012	1.85	**2.26**	2.02	1.97	2.20	1.92	1.93	1.90	1.89	1.93	1.98	1.60	2.26
2013	1.88	1.84	**2.35**	1.84	1.76	1.18	1.03	2.13	2.15	1.68	1.49	1.35	2.35
2014	1.94	1.76	1.93	**2.00**	1.90	1.48	1.54	1.77	1.89	1.80	1.98	1.64	2.00
2015	1.68	2.07	1.78	**2.09**	1.82	1.46	1.83	1.68	1.89	1.68	1.89	1.60	2.09
2016	1.75	**1.91**	1.90	1.68	1.65	1.24	1.21	1.77	1.68	1.56	1.49	1.16	1.91
2017	**1.78**	1.44	1.29	1.56	1.63	1.03	1.26	1.31	1.73	1.31	1.10	1.09	1.78
2018	1.21	1.00	1.23	1.30	1.40	1.00	1.10	**1.73**	1.68	1.34	1.56	1.17	1.73
2019	1.43	1.31	1.19	1.36	1.23	0.80	1.32	1.39	**1.44**	1.36	1.32	1.20	1.44

Notes: NA = Not available.
Bold values = maximum value for year.

Similar to many water utilities in Connecticut, overall demand on the UConn water system has decreased over time as seen in the data through 2016. This trend has continued even with the continuing buildout of the UConn 2000, 21st Century UConn, and NextGen projects due to a variety of projects and programs aimed at reducing overall water demand. Projects that have helped to reduce potable water demand have included:

- Demolition of older, water inefficient buildings;
- Construction of new buildings with more efficient water use devices;
- Installation of water-efficient research equipment;
- Repair and replacement of old and/or leaking water pipes, in particular the 16-inch transmission main from the Willimantic River Wellfield to the 5.4 MG reservoir;
- Repair and replacement of certain steam condensate lines which return water to the steam heating system and thereby reduce potable water consumption; and
- Completion of the RWF and conversion of much of the CUP demand to non-potable water;

The production data following 2016 is reflective of the period where the CWC interconnection was in place, resulting in greatly reduced demands for the UConn system as former off-campus customers were transitioned to CWC. In addition, grey water lines were extended from the RWF to the ESB and the IPB during this period which reduced overall water demands at these facilities.

Whereas the peak month demands are fairly constant, as shown in Table 5-12 the PDD can occur during nearly any month of the year. This is because PDD is often tied to abrupt changes in storage due to main breaks, main and/or tank flushing, and other non-typical demand events such as fire flows. PDD can also be tied to pumping tests; for example, the PDD in August 2008, September 2009, and November 2009 correspond to the 72-hour pumping tests associated with the Willimantic River Study. The maximum annual PDD since 2011 was 2.35 MG in March 2013.

Table 5-13 is a multi-page table that presents the monthly water production at each individual well for the period 2011 through 2019. Refer to previous versions of the *Water Supply Plan* for earlier individual well data. Production levels at the Fenton River Wellfield have tended to decrease through the summer and autumn months since the utilization of the recommendations of the Fenton River Study, and Well A continues to be held in reserve as an emergency well.

Historically, the Fenton River Wellfield produces approximately 20% of the water used each year, while the Willimantic River Wellfield produces approximately 80%. More recently, in 2018 and 2019, the Fenton River Wellfield produced approximately 55% of the water used due to reduced system demands and favorable streamflow conditions. Together, the two wellfields produced approximately 380 to 470 million gallons per year from 2011 through 2016, and approximately 260 to 330 million gallons per year from 2017 through 2019.

TABLE 5-13
UConn Monthly Water Production (Thousands of Gallons)

Month	Well #1	Well #2	Well #3	Well #4	Well A	Well B	Well C	Well D
2011								
Jan.	10,421.0	3,927.8	10,465.0	6,720.0	0.0	3,926.0	2,218.0	611.0
Feb.	12,882.0	5,152.1	13,020.0	8,366.0	0.0	3,792.0	2,159.0	230.0
Mar.	12,150.0	4,596.0	12,192.0	7,808.0	0.0	4,473.0	2,548.0	1,111.0
Apr.	12,267.0	4,785.1	12,332.0	7,894.0	0.0	4,165.0	2,366.0	922.0
May	7,504.0	3,060.3	7,546.0	4,815.0	0.0	3,992.0	2,307.0	52.0
June	8,832.0	3,489.0	8,904.0	5,660.0	0.0	356.0	205.0	0.0
July	10,510.0	4,338.4	10,668.0	6,758.0	0.0	155.0	88.0	1.0
Aug.	11,421.0	4,523.2	11,459.0	7,263.0	0.0	753.0	430.0	0.0
Sept.	14,225.0	5,647.4	14,293.0	9,263.0	0.0	3,261.0	1,926.0	0.0
Oct.	13,104.0	5,181.9	13,060.0	8,797.0	0.0	3,600.0	2,045.0	471.0
Nov.	11,826.0	4,582.5	11,898.0	7,612.0	0.0	2,892.0	1,611.0	495.0
Dec.	10,953.0	4,275.3	10,965.0	7,063.0	0.0	2,181.0	1,236.0	498.0
2012								
Jan.	11,921.0	4,586.9	11,354.0	7,711.0	0.0	5,337.0	3,024.0	2,879.0
Feb.	12,151.0	4,664.9	12,007.0	7,389.0	0.0	4,058.0	2,292.0	0.0
Mar.	10,969.0	4,191.7	10,960.0	7,035.0	0.0	4,892.0	2,759.0	3,754.0
Apr.	13,235.0	5,005.5	12,841.0	8,576.0	0.0	6,339.0	3,551.0	794.0
May	6,491.0	2,460.5	6,319.0	4,140.0	0.0	181.0	101.0	40.0
June	6,579.0	2,467.2	6,742.0	4,019.0	0.0	0.0	0.0	132.0
July	11,549.0	4,513.4	11,078.0	7,298.0	0.0	0.0	0.0	0.0
Aug.	10,882.0	4,891.3	11,549.0	7,747.0	0.0	24.0	10.0	881.0
Sept.	15,056.0	5,947.9	14,254.0	9,947.0	0.0	961.0	534.0	5,538.0
Oct.	14,402.0	5,605.5	13,780.0	9,579.0	0.0	6,295.0	3,525.0	1.0
Nov.	10,188.0	3,989.5	9,391.0	6,727.0	0.0	5,337.0	3,024.0	2,879.0
Dec.	7,135.0	2,972.0	6,415.0	5,076.0	0.0	4,058.0	2,292.0	0.0
2013								
Jan.	7,616.0	2,888.9	7,416.0	4,999.0	0.0	7,389.0	3,685.0	0.0
Feb.	10,148.0	3,932.3	9,679.0	6,567.0	0.0	6,661.0	3,491.0	0.0
Mar.	10,710.0	4,234.0	10,311.0	6,966.0	0.0	4,746.0	2,668.0	0.0
Apr.	10,674.0	4,985.2	10160.0	6,833.0	0.0	6,664.0	3,735.0	0.0
May	9,412.0	3,752.4	9,066.0	6,029.0	0.0	529.0	658.0	75.0
June	4,591.0	1,878.0	4,381.0	2,916.0	0.0	5,873.0	3,325.0	11.0
July	4,375.0	1,768.6	4,174.0	2,759.0	0.0	7,247.0	4,081.0	72.0
Aug.	7,380.0	2,934.0	7,019.0	4,679.0	0.0	6,253.0	3,502.0	0.0
Sept.	9,444.0	3,567.0	8,923.0	5,766.0	0.0	7,211.0	4,032.0	0.0
Oct.	10,536.0	3,526.1	10,021.0	5,989.0	0.0	4,473.0	2,496.0	0.0
Nov.	10,821.0	4,228.9	10,316.0	6,906.0	0.0	0.0	0.0	0.0
Dec.	8,662.0	3,404.3	8,268.0	5,679.0	0.0	74.0	45.0	0.0

TABLE 5-13
UConn Monthly Water Production (Thousands of Gallons)

Month		Well #1	Well #2	Well #3	Well #4		Well A	Well B	Well C	Well D
2014										
Jan.		10,641.0	4,214.8	10,165.0	7,165.0		0.0	799.0	449.0	0.0
Feb.		8,803.0	3,457.3	8,405.0	5,960.0		0.0	6,355.0	3,560.0	0.0
Mar.		10,118.0	3,974.6	9,662.0	6,850.0		0.0	3,505.0	1,960.0	4,996.0
Apr.		10,061.0	3,985.7	9,600.0	6,989.0		0.0	105.0	61.0	10,719.0
May		6,259.0	2,618.1	6,559.0	4,165.0		0.0	1,118.0	681.0	8,938.0
June		5,423.0	2,200.8	5,553.0	3,424.0		0.0	4,184.0	2,354.0	4,280.0
July		5,991.0	3,219.4	8,242.0	5,839.0		0.0	1,701.0	955.0	1,904.0
Aug.		10,582.0	4,034.5	10,069.0	7,075.0		0.0	32.0	18.0	617.0
Sept.		14,104.0	5,357.0	13,430.0	9,534.0		0.0	0.0	0.0	797.0
Oct.		13,683.0	5,197.1	13,039.0	9,263.0		0.0	4.0	2.0	1,533.0
Nov.		11,443.0	4,450.9	11,243.0	8,002.0		0.0	3.0	2.0	672.0
Dec.		9,125.0	3,454.1	9,188.0	6,539.0		0.0	0.0	0.0	764.0
2015										
Jan.		8,688.0	3,459.0	8,747.0	6,193.0		0.0	509.0	289.0	6,917.0
Feb.		10,034.0	4,002.9	10,138.0	7,177.0		0.0	6,385.0	3,554.0	200.0
Mar.		9,082.0	3,628.5	9,167.0	6,474.0		0.0	7,213.0	4,012.0	73.0
Apr.		9,699.0	3,912.5	9,816.0	6,938.0		0.0	6,940.0	3,902.0	0.0
May		7,181.0	2,900.3	7,300.0	5,101.0		0.0	7,181.0	4,019.0	15.0
June		5,347.0	2,019.6	5,386.0	3,790.0		0.0	0.0	0.0	9442.0
July		8,958.0	3,764.0	9,515.0	6,675.0		0.0	21.0	11.0	2,692.0
Aug.		8,948.0	3,721.6	9,383.0	6,484.0		0.0	0.0	0.0	1,206.0
Sept.		13,632.0	5,446.7	13,686.0	9,660.0		0.0	0.0	1.0	547.0
Oct.		14,308.0	5,737.2	14,421.0	10,216.0		0.0	0.0	0.0	43.0
Nov.		11,040.0	4,392.9	11,130.0	7,893.0		0.0	0.0	0.0	39.0
Dec.		10,610.0	4,186.2	10,766.0	7,209.0		0.0	8.0	8.0	54.0
2016										
Jan.		10,011.0	3,986.2	10,449.0	7,216.0		0.0	4.0	21.0	1,739.0
Feb.		10,658.0	4,247.1	10,747.0	7,635.0		0.0	2,168.0	2,548.0	1,110.0
Mar.		7,994.0	3,110.1	8,200.0	5,555.0		0.0	4,958.0	5,929.0	2.0
Apr.		8,532.0	3,424.1	8,936.0	6,090.0		0.0	5,088.0	5,682.0	3.0
May		5,091.0	2,052.0	5,187.0	3,629.0		0.0	4,818.0	6,348.0	4.0
June		4,651.0	2,258.6	5,631.0	3,960.0		0.0	3,625.0	4,251.0	14.0
July		8,617.0	3,191.0	8,657.0	6,084.0		0.0	0.0	0.0	0.0
Aug.		9,752.0	2,569.2	10,255.0	7,083.0		0.0	0.0	0.0	0.0
Sept.		13,434.0	1,978.9	14,128.0	9,451.0		0.0	0.0	0.0	0.0
Oct.		12,484.0	4,073.0	13,293.0	8,891.0		0.0	0.0	0.0	0.0
Nov.		8,501.0	3,627.5	9,471.0	6,341.0		0.0	0.0	0.0	37.0
Dec.		6,975.0	2,639.0	7,486.0	5,037.0		0.0	0.0	0.0	0.0

TABLE 5-13
UConn Monthly Water Production (Thousands of Gallons)

Month	Well #1	Well #2	Well #3	Well #4	Well A	Well B	Well C	Well D
2017								
Jan.	8,186.0	3,150.0	8,996.0	6,037.0	0.0	0.0	0.0	0.0
Feb.	9,880.0	3,583.8	10,551.0	7,062.0	0.0	0.0	0.0	36.0
Mar.	6,218.0	2,299.5	6,648.0	4,460.0	0.0	2,172.0	2,513.0	5,285.0
Apr.	7,294.0	2,688.0	7,739.0	5,179.0	0.0	5,014.0	5,749.0	3.0
May	4,360.0	1,595.0	4,663.0	3,090.0	0.0	4,343.0	4,993.0	6.0
June	3,187.0	1,187.4	3,410.0	2,267.0	0.0	6,023.0	6,967.0	4.0
July	5,765.0	2,098.6	6,146.0	4,085.0	0.0	3,572.0	4,109.0	11.0
Aug.	6,199.0	2,280.2	6,687.0	4,449.0	0.0	3,998.0	4,607.0	5.0
Sept.	10,439.0	3,738.8	11,062.0	7,328.0	0.0	1,408.0	1,614.0	2.0
Oct.	8,756.0	3,196.7	9,342.0	6,201.0	0.0	1,022.0	1,141.0	58.0
Nov.	3,090.0	1,171.1	3,358.0	2,242.0	0.0	5,731.0	6,348.0	3.0
Dec.	4,508.0	1,675.5	4,903.0	3,215.0	0.0	2,593.0	2,160.0	4.0
2018								
Jan.	3,749.0	1,412.9	4,087.0	2,692.0	0.0	4,890.0	4,958.0	3.0
Feb.	2,068.0	1,705.6	4,997.0	3,296.0	0.0	4,213.0	4,608.0	7.0
Mar.	3,764.0	1,584.8	4,595.0	3,054.0	0.0	5,060.0	5,606.0	48.0
Apr.	5,036.0	1,865.7	5,418.0	3,597.0	0.0	6,074.0	6,716.0	6.0
May	1,847.0	687.4	1,928.0	1,311.0	0.0	5,913.0	6,896.0	9.0
June	908.0	665.3	1,922.0	1,273.0	0.0	6,140.0	6,767.0	5.0
July	0.0	1,508.1	4,145.0	2,757.0	0.0	5,896.0	6,495.0	7.0
Aug.	2,044.0	2,204.1	6,204.0	3,153.0	0.0	5,834.0	6,365.0	5.0
Sept.	6,952.0	2,658.7	6,143.0	0.0	0.0	6,711.0	7,129.0	5.0
Oct.	3,849.0	1,628.8	4,718.0	2,666.0	0.0	6,804.0	7,095.0	11.0
Nov.	2,953.0	1,051.6	3,144.0	2,398.0	0.0	6,289.0	6,675.0	5.0
Dec.	2,127.0	771.7	2,280.0	1,466.0	0.0	5,136.0	5,511.0	5.0
2019								
Jan.	1,772.0	668.1	2,039.0	1,267.0	0.0	5,358.0	5,784.0	29.0
Feb.	3,645.0	1,322.5	4,030.0	2,532.0	0.0	5,996.0	6,537.0	6.0
Mar.	3,442.0	1,249.3	3,667.0	2,325.0	0.0	6,436.0	7,042.0	12.0
Apr.	4,094.0	1,516.5	4,409.0	2,838.0	0.0	6,406.0	6,934.0	8.0
May	1,759.0	565.1	1,777.0	1,279.0	0.0	5,625.0	6,054.0	5.0
June	861.0	2.0	18.0	758.0	0.0	5,852.0	6,293.0	1.0
July	2,712.0	315.0	2,558.0	1,589.0	0.0	6,367.0	6,879.0	2.0
Aug.	3,630.0	1,485.6	3,883.0	2,031.0	0.0	8,766.0	5,044.0	0.0
Sept.	6,041.0	2,353.4	6,152.0	3,096.0	0.0	10,717.0	3,004.0	0.0
Oct.	5,116.0	1,956.9	5,116.0	2,660.0	0.0	7,766.0	6,013.0	1.0
Nov.	2,870.0	1,088.0	2,870.0	1,651.0	0.0	5,732.0	6,522.0	7.0
Dec.	1,271.0	481.0	1,271.0	666.0	0.0	5,497.0	6,270.0	7.0

5.4 Non-Revenue & Unaccounted-for Water

Typically, "non-revenue water" is the difference between total water produced at the source and metered water consumption. Some of the traditional non-revenue uses include tank flushing, main flushing and blow-offs, firefighting, main breaks, and unauthorized water use; and these can and occasionally do occur throughout the UConn water system. However, UConn is not a traditional revenue-producing utility, so the term is a misnomer in this context. While UConn produces a minimal amount water that results in the collection of "revenue," the majority of its water production is to provide itself with water. Therefore, a discussion of non-revenue water in the traditional context is not pertinent to the UConn water system.

More pertinent to the UConn water system is the difference between metered consumption and non-metered consumption in relation to production. UConn estimated non-metered water usage in the 2011 *Water Supply Plan* as approximately 15% of production. This value suggested that UConn's unaccounted-for water demand (water that is not accounted for through metering or estimated uses) was less than 15% of total production. The 15% figure is the standard for unaccounted-for water, and typically represents losses due to leaky infrastructure.

Recent data continues to reflect that unaccounted-for water is less than 15% of total production. Table 5-14 presents non-metered water usage for the last three calendar years. The last three years of data are presented because earlier years represent a condition where either the CWC interconnection is not present and/or the RWF is not yet online. Note that the data for 2017 represents a transition year where off-campus customers were transferred to CWC.

TABLE 5-14
Recent Unmetered Water Usage

Year	Wellfield Production (mgd)	On-Campus Residential Metered Consumption (mgd)	On-Campus Non-Residential Metered Consumption (mgd)	Off-Campus Consumption (mgd)	Non-Metered Water (mgd)	Non-Metered as % of Wellfield Production
2017	0.897	0.270	0.380	0.002	0.245	27%
2018	0.752	0.272	0.419	0.002	0.059	8%
2019	0.723	0.255	0.439	0.002	0.027	4%
Average	**0.791**	**0.266**	**0.413**	**0.002**	**0.110**	**14%**

Thus, approximately 14% of the potable water produced by UConn is a combination of (1) distributed water that is consumed by un-metered uses; and (2) transmitted/distributed water that is truly unaccounted or lost. It is therefore believed that UConn's true "unaccounted-for water" continues to amount to much less than 15% of total production each year.

The improvement schedules presented in Section 7.0 include continuation of the ongoing metering program, annual water audits, and biennial leak detection surveys to assess unaccounted-for water. These efforts are anticipated to maintain unaccounted for water at levels below 15%.

6.0 LAND USE, FUTURE SERVICE AREA, & DEMAND PROJECTIONS

6.1 General

An evaluation and analysis of existing and future land uses and zoning was conducted as required by the water supply planning regulations to assess the water supply needs for the UConn water service area. Different land uses generate varying amounts of water demand. In this section, existing land use is described, and future development potential is investigated for UConn. This analysis provides the basis for demand projections in the 5-, 20-, and 50-year planning periods. The approach, the assumptions used, and sources of data are presented in detail in the ensuing text.

Note that off-campus customers will be served by CWC for the foreseeable future. Therefore, projection of off-campus demands is now the responsibility of CWC and will be included in their water supply planning efforts for the CWC Western system and CWC's off-campus systems.

6.2 Land Use, Zoning, and Future Service Area

6.2.1 Existing and Exclusive Service Areas

The boundary of the existing UConn water service area is shown on Figure 1-1 and Appended Figure I. The water service area has changed significantly since the 2011 *Water Supply Plan* was issued but remains entirely constrained within the Town of Mansfield. Off-campus properties in the Town of Mansfield previously served by UConn became customers of CWC in December 2016 when the CWC interconnection was activated. UConn's water service area is now smaller than it was in 2011 and is further described below in the context of the State of Connecticut ESAs for water service.

In 1986, the State of Connecticut established seven Public Water Supply Management Areas (PWSMA) to coordinate state-wide public water supply planning. The original seven PWSMAs were consolidated to three PWSMAs regions (East, West, and Central) in October 2014, with the UConn water service area located within the Central PWSMA. Beginning in June 2016, the Central Corridor Water Utility Coordinating Committee (Central WUCC) met to discuss a variety of water supply topics that impact the region, including the establishment of ESA boundaries in the Town of Mansfield. UConn participated in the entire formal two-year WUCC process and continues to participate in ongoing WUCC meetings.

The Central WUCC recommendations on ESA boundaries for the Central Region PWSMA were published in a 2017 report[18] and subsequently approved by DPH. The report notes that based on the wording of the enabling statute[19], state agencies such as UConn are not authorized to have a formal ESA. Nevertheless, the Central WUCC voted to assign the majority of UConn-owned or controlled property as "State Agency Existing Service Area" to reflect UConn's extensive water system and the area reserved for service by UConn. However, based on

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[18] Milone & MacBroom, Inc., 2017, *Coordinated Water System Plan, Part II – Final Recommended Exclusive Service Area Boundaries,* Connecticut DPH, https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/drinking_water/pdf/CentralESADocument_final20170614.pdf

[19] As determined during the 2016-2018 WUCC process, based on CGS Section 25-33g state agencies cannot be ESA holders. Recognizing that several state agencies (including UConn) own and operate public water systems, the WUCC process reserved certain state lands for service by those state agencies without explicitly assigning an ESA.

coordination with the Town of Mansfield, vacant wooded land surrounding the Fenton River Wellfield, and several UConn-controlled wooded or farm land parcels located west and southeast of the Main Campus, are not considered to be within the "State Agency Existing Service Area" designation and are instead defined as "unassigned" ESAs where public water service is generally not expected to be needed for the foreseeable future.

Areas of Mansfield surrounding UConn that are not considered to be served by the UConn water system (or were left unassigned as noted above) were assigned as either the ESA for existing public water systems or as the ESA for CWC. Several small "community" water systems (those public water supply systems that serve at least 15 service connections or at least 25 of the same population year round, such as subdivisions, cluster housing, apartments, or condominiums) are found adjacent to the UConn service area (see Appended Figure I), but are served by bedrock wells and are not anticipated to affect the UConn water supply. The Central WUCC assigned these entities an ESA coterminous with their service areas. CWC was assigned responsibility for providing public water service to the majority of the remaining areas of Mansfield should it become necessary, with the remaining area in the southern portion of Mansfield being assigned as the ESA of Windham Water Works.

As shown on Appended Figure I, the area reserved for service by the UConn water system includes parcels and buildings that are now served by CWC per the 2013 contract. This discrepancy is because the "State Agency Existing Service Area" was based on UConn-owned and controlled parcels, but some of those parcels (including larger parcels with certain subset areas) are considered to be "off-campus" uses. The opposite is also true in certain cases, such as for the "off-campus" customers who are still served by UConn along North Eagleville Road. Note that this discrepancy between the existing service area and the ESA boundary is not an issue as the service to these areas is governed by contract. UConn does not anticipate serving areas presently served by CWC or serving any additional areas outside of its reserved service area for the foreseeable future.

6.2.2 Land Use

Land use in the Town of Mansfield, including UConn lands, is described in the MT-POCD adopted by the Town Planning and Zoning Commission on September 8, 2015 and effective October 8, 2015. The MT-POCD was developed by the Town in accordance with CGS Section 8-23 which requires municipalities to adopt a POCD every ten years. The 2015 MT-POCD consolidates and expands on work done as part of a project known as Mansfield 2020: A Unified Vision Strategic Plan, dated August 2008. The 2015 MT-POCD also builds on a previous POCD from January 2006. Town of Mansfield Comprehensive Annual Financial Reports for 2011 through 2018 were also reviewed for information on development in the Town since the previous 2011 *Water Supply Plan* was issued.

Mansfield's early development was characterized by a series of 18 village centers typically located near churches, mills, and/or important crossroads. Houses were clustered near these centers, which were often surrounded by agricultural land or wood-lots. Several historical development areas were within or in close proximity to the current UConn water service areas at the Main and Depot Campuses.

During the 20th century, and particularly since 1950, development has been concentrated in a few areas where public water and sewer have been available near the urbanized core of UConn in the northern part of Mansfield and near the village of Willimantic to the south. These development patterns were influenced by the growth of the UConn, Willimantic's nearby urban center, availability of public water and sewer utilities, Mansfield's natural resource development limitations, and municipal land use policies.

The UConn water system has been closely tied to land use in Mansfield and historically allowed development of residential, commercial, and institutional land concentrated in the vicinity of Storrs. Previous expansions of the water system were undertaken to facilitate town-owned development of residential and community facilities near the intersection of South Eagleville Road and Maple Avenue. UConn has accommodated extension of the water system to development outside the UConn-owned or controlled lands in the past, but future expansion of development areas by the Town will require less UConn involvement since the Town will now coordinate water supply with CWC.

Based on U.S. Census data, approximately 26,543 people lived in Mansfield in 2010. U.S. Census estimates for 2018 indicate Mansfield's population at 25,817, which is approximately 3% below the 2010 census population.

According to the U.S. Census data, Mansfield had approximately 6,017 housing units in 2010, excluding "group quarters" facilities at UConn and nursing homes (note that the Bergin Correctional Facility was identified as a group quarters in the 2011 *Water Supply Plan*, but this facility closed in 2011). Approximately 56%, or 3,138 housing units were single-family homes. From 2000 to 2010, the number of housing units increased by about 431 units. According to the MT-POCD, in the twelve-year period from 2000 to 2012, single-family housing permits in Mansfield peaked in 2006 and then began declining through the economic downturn to the lowest levels in the period in 2010.

A number of significant private and governmental building projects have occurred in Mansfield since 2010. The most significant of these projects was the construction of Storrs Center which opened in 2012 and is located across Route 195 from the Main Campus in the vicinity of Dog Lane. This mixed residential and commercial development has approximately 290 studio, one-, two-, and three-bedroom apartments over ground-level retail shops and commercial space. Also included in the Storrs Center project are a stand-alone supermarket, a multi-story parking garage (built 2012), and an intermodal transportation center (built 2014) with transit (bus) services, bicycle commuter facilities, and office space.

The incidence of multi-family permits in Mansfield increased significantly in 2010 due to the start of construction of Storrs Center. A total of 265 new building lots were approved between 2000 and 2012, however only 5 subdivisions and 27 lots were created between 2009 and 2012. Data found on the Census Reporter website[20] from the 2018 5-year American Community Survey indicates approximately 6,170 housing units were available in 2018, with 55% of those being single (family) units.

Commercial development and redevelopment in Mansfield have been relatively limited in the last two decades, other than the Storrs Center project described above. Very few industrial land uses are present in the Town of Mansfield.

6.2.3 Review of UConn Planning Documents

UConn's existing and proposed land use was most recently summarized in the May 2015 Campus Master Plan[21] prepared by UPDC. The Master Plan used 2014 data to address immediate (2015) building and infrastructure needs, as well as projected future needs for 10-, 20-, and long-term (beyond 20 years) time horizons. Projected end dates for the Master Plan horizons were as follows: 2020 to address needs within 5 years; 2025 for the 10-

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[20] https://censusreporter.org/profiles/06000US0901344910-mansfield-town-tolland-county-ct/

[21] Skidmore, Owings & Merrill, LLP, 2015, *UConn Campus Master Plan*, University of Connecticut: University Planning, Design, and Construction, https://masterplan.uconn.edu/.

year horizon; 2035 for the 20-year horizon; and beyond 2035 for long-term growth opportunities. Planning information and data presented in the 2015 Campus Master Plan has been used in our assessment of water demand required over the 5-, 20-, and 50-year time horizons in this *2020 Plan*.

In 2015, UPDC planners focused their efforts on development of Science Technology Engineering and Math (STEM)-related building projects funded through the State's NextGen initiative. New science buildings, residence halls, student activity facilities, and parking areas have been designed and constructed to enhance STEM education, foster advanced collaborative research, and develop sustainable facilities and infrastructure that support UConn's commitment to efficient use of water and energy while reducing carbon emissions. Since 2015, new development projects have included the IPB on Discovery Drive (a STEM maker space), the Werth Residential Towers on Alumni Drive (a new dormitory for STEM students), and the ESB on the northeast science quadrangle (a new engineering building). Infrastructure improvement projects were completed alongside new buildings, including the construction of Discovery drive, which extends Hillside Road north to Route 44. Other projects included the completion of the Main Accumulation Area building near C-Lot.

Although some new on-campus student housing (Werth Residential Towers) has been constructed during the NextGen initiative, certain other older student housing (e.g. Connecticut Commons graduate dormitory complex) has been demolished and renovation of a number of dormitories has resulted in an overall decrease of on-campus (dormitory and apartment) living units. An Honor Students Dormitory that was anticipated in the 2015 Master Plan was tabled for future development if needed in the future based on potentially increasing student enrollment.

In 2010, UConn reported that the population of on-campus housing was 12,689 people while in 2019 this estimate has decreased to 12,047, including 11,633 served by the UConn water system (see Section 5.2.1). Although the on-campus student population has decreased since 2010, off-campus housing has increased to accommodate student housing needs, which have been relatively constant for the last five years. UConn reported 19,133 undergraduate and 6,693 graduate/professional students (25,826 total) at the Main Campus for the 2018-2019 academic year, compared to 18,032 undergraduates and 7,879 graduate/professional students (25,911 total) in 2013-2014. At this time, the Residential Life Office predicts student enrollment will continue to be relatively flat in the near future; although increases of some 1,000 to 5,000 students are still possible (as was anticipated in the 2015 Master Plan) over longer time horizons (10, 20, or 50 years from now). UPDC continues to plan for such enrollment increases.

The 2015 Campus Master Plan indicates that UConn had approximately 350 buildings with approximately 6,262,500 assignable square feet (ASF) at the Main Campus at that time. Projections for future space needs were developed using a multi-tiered model, where it was assumed future student enrollment would increase by some 1,000 to 5,000 additional students over the foreseeable future. Considering 2014 enrollment numbers and the condition of existing buildings and infrastructure, the Master Plan estimated a need for some 796,000 ASF of new space in the near term (2015-2020). With an enrollment increase of some 1,000 additional students by 2025, the Master Plan estimated the need for another 534,000 ASF. Finally, with an enrollment increase of 5,000 additional students by 2035, the Plan estimated the need for another 835,000 ASF.

Relative to construction near the boundary of the UConn campus, the MT-POCD describes 2015 municipal data, presents a compilation of Town planning efforts completed in 2006 and 2008, and summarizes the Town's framework of values, goals, and strategies intended to guide planning and zoning decisions for the next 20 years (through 2035). The goals, strategies, and actions that are summarized at the end of each chapter of the MT-POCD constitute the Town's action plan for conservation and development. For the most part, the MT-POCD recommends land use similar to that described in previous planning documents, with the most intensive land uses proximal to UConn (in north-central Mansfield) and the village of Willimantic (in southern Mansfield). Compact development in the vicinity of existing infrastructure is recommended in the MT-POCD to reduce sprawl and maintain the rural character of the remaining portions of Mansfield.

6.2.4 Zoning

The zoning map for the Town of Mansfield is included as Appended Figure II. Table 6-1 summarizes the zoning districts in the Town of Mansfield. Since the 2011 *Water Supply Plan* was issued, the Town of Mansfield has eliminated the Age Restricted Housing and Industrial Zoning Districts and has re-designated such properties as being in "Other" Districts, which includes "Research & Development/Limited Industrial" Zones.

TABLE 6-1
Summary of Zoning Designations

Type	Symbol	Zone
Residential	R-20	Residence 20
	R-90	Residence 90
	RAR-90	Rural Agriculture Residence 90
	DMR	Design Multiple Residence Zone
Business	PB-1 through PB-5	Planned Business Zones 1 through 5
	B	Business Zone
	NB-1 and NB-2	Neighborhood Business Zones
	PO-1	Professional Office Zone 1
Other	RD/LI	Research & Development/Limited Industrial Zone
	I	Institutional
	FH	Flood Hazard Zone
	SC-SDD	Storrs Center Special Design District
	PVRA	Pleasant Valley Residence/Agriculture Zone
	PVCA	Pleasant Valley Commercial/Agricultural Zone
	W	Water Pipeline Overlay Zone

The UConn water service area includes properties with the following zoning designations:

- Institutional Zone (I) for properties with UConn buildings that comprise the majority of the Main and Depot Campuses, along with many areas along the edge of campus;
- Research and Development / Limited Industrial (RD/LI) for properties associated with the Technology Park in North Campus;
- Rural Agricultural Residence 90 Zone (RAR-90) for properties surrounding the two UConn well fields and certain UConn-controlled agricultural land and maintenance areas (Depot Campus maintenance buildings); and
- Residence Zone 90 (R-90) for a few properties on the west side of the Main Campus.

Future development described below in Section 6.2.6 are located in Rural Agricultural Residence 90 Zone (RAR-90) and Institutional Zone (I). These developments (to be served by the UConn water system) are believed to be generally appropriate relative to their zoning.

6.2.5 General Discussion of Potential Future Water Demands

UConn ceased providing water service to most off-campus properties in late 2016 when the CWC interconnection was completed and those customers were transferred to CWC. Future expansion of the UConn water system to serve off-campus, non-UConn properties is not anticipated. However, continued buildout of the North Campus Technology Park, redevelopment of older, underutilized buildings on the Depot Campus, and an increase in building density on the Main Campus and Depot Campus may result in somewhat greater water demand with time.

The completed CWC interconnection is presently contracted and permitted to provide up to 1.5 mgd to meet UConn's needs, with an additional 0.35 mgd permitted to meet CWC's off-campus needs. CWC anticipates providing between 1.3 and 2.2 mgd for combined UConn and off-campus needs over a 50-year planning horizon. The MT-POCD recognizes that the CWC interconnection will be used to supplement, not replace, the UConn wellfields.

UConn is a member of the Water System Advisory Committee. Representatives from CWC also attend to assist in advising on local water supply issues and to help manage new connections, address water line extension requests, and support water conservation initiatives.

A comprehensive analysis of the Town of Mansfield's current water needs is not presented here since the CWC interconnection and the various related contractual agreements have eliminated the need for UConn to directly supply water to off-campus customers. Potential future service areas for the Town of Mansfield would be discussed in the *Water Supply Plan* for the CWC Western System. Any expansion of the CWC off-campus public water systems will be addressed by CWC in conjunction with the Water System Advisory Committee.

6.2.6 Potential Development Areas

Subsequent to the completion of the previous water supply planning studies for the area in 2002, 2004, 2007, and 2011, UConn revisited its needs for future water service in the 2015 Campus Master Plan (see Appendix D of that Plan: Utilities Master Plan). Based on the 2015 Master Plan, and construction completed or in process, UConn has a firm understanding of water demands that, (1) are likely to occur, and (2) will be served from the UConn water system.

A general discussion of planned UConn growth is presented below for both the Main Campus and the Depot Campus. Specific water demands are presented in Section 6.3.

<u>Main Campus</u>

Since 2011, major projects in the North Eagleville Science District have included the construction of the ESB in 2016, the Peter J. Werth Residence Tower in 2016, and a complete renovation of the south wing of the Gant Science Building in 2017-2019. The Werth Residence Tower added 725 student beds to campus. Phases 2 (west wing) and 3 (north wing) of the Gant Complex renovations will be completed in 2023. In 2018-2019 in the Hillside Road District, a new Student Recreation Center was constructed at the location of the former Connecticut

Commons residential dormitory buildings (which were demolished). In the South Campus District, the Fine Arts Complex was renovated and expanded in 2018 and 2019. The IPB was constructed along Discovery Drive in the north part of the Main Campus in 2016-2017. No significant new construction was completed in the East Campus Districts. In the West Campus District, a significant renovation of athletic fields and renovation and expansion of training facilities was initiated in 2019, with planned completion in 2020. These efforts include switching from natural grass playing fields to artificial turf, and is anticipated to save approximately 9 million gallons of irrigation water per year[22].

Many of the projects listed above were identified in the Near-Term schedule (2015-2020) in the 2015 Campus Master Plan. The 2015 Campus Master Plan identifies potential new development and renovation activities across the Main Campus. These activities have the potential to increase water demands (new buildings or uses) as well as to reduce water demands (through renovation activities that increase water efficiency). In the near term, the Master Plan focused on the North Eagleville Road Science District, initial stages of development of the Technology Park, Athletics District redevelopment, and South Campus. Mid-term, projects begin to expand inward towards the Academic Core. The long-term Master Plan focused primarily on renovations with some presently unfunded new buildings identified. Details are presented below:

- The 2015 Master Plan indicates water demand increases for 2015-2020 were to be tied to construction and/or renovation of new science and research buildings, residence halls, and student health and recreation spaces that could increase water demand. The major renovation projects were to include design elements that reduce water demand through the use of more efficient fixtures as well as the UConn's continued focus on water conservation initiatives. Note that several projects that were anticipated in the 2015 Master Plan have been put on hold due to budget constraints, including proposed STEM research center buildings. The plan also notes that demand may be less if UConn can realize between 10 and 30% water savings due to conservation and sustainability initiatives.

- Similarly, the 2015 Master Plan indicates projected water demand increases for the 2020-2025 planning period will be tied to construction and/or renovation of new research and classroom buildings, residence halls, and student activity spaces that could increase water demand. Construction projects planned for the Main Campus in the 2015 Master Plan are anticipated to realize a smaller water demand increase over this time period since the NextGen building program will be winding down after 2030.

- The 2015 Master Plan likewise indicates projected water demand increases for the 2025-2035 planning period will be tied to construction and/or renovation of additional academic, residential, fine arts and other facilities that could increase overall water demand. Since UPDC has not estimated potential construction out to the 2070 horizon used in this *2020 Plan*, it is assumed that future new water demands will significantly level off beyond 2040.

<u>Depot Campus</u>

While the 2015 Campus Master Plan indicates new growth will be focused on the Main Campus, the Depot Campus will likely support "back-of-house" functions in the short-term as well as providing temporary overflow

[22] Milone & MacBroom, Inc., 2018, *Environmental Assessment Review – University of Connecticut Athletics District Improvements*, University of Connecticut.

space during construction projects. Mid-term and beyond, the Depot Campus may be the location of public-private development if market conditions support such growth.

Additional development and redevelopment of the Depot Campus area was addressed in detail as part of the 2000 Outlying Parcels Master Plan. A mixture of housing and offices is possible, but no new academic buildings are planned for the Depot Campus at this time.

6.3 Population Projections

The Town of Mansfield has a population count that is uniquely influenced by UConn. Table 6-2 summarizes town-wide population since 1920 alongside statewide population.

TABLE 6-2
Historic Population Data

Year	STATE OF CONNECTICUT		TOWN OF MANSFIELD	
	Population	% Change	Population	% Change
1920	1,380,631	--	2,574	--
1930	1,606,903	16.4%	3,349	30.11%
1940	1,709,242	6.4%	4,559	36.13%
1950	2,007,280	17.4%	10,008	119.52%
1960	2,535,234	26.3%	14,638	46.26%
1970	3,029,074	19.6%	19,994	36.59%
1980	3,107,576	2.5%	20,634	3.20%
1990	3,287,116	5.8%	21,103	2.27%
2000	3,405,565	3.6%	20,720	-1.81%
2010	3,574,097	4.9%	26,543	28.10%
2018	3,572,665	-0.04%	25,817	-2.74%

Source: U.S. Census Bureau

The water supply planning regulations require the evaluation of population projections that were formerly maintained and updated by the Connecticut Office of Policy and Management (OPM). Because the OPM projections are very much out-of-date, their utility for water supply planning has decreased over the last two decades. Projections are additionally insufficient for understanding population growth on the UConn campus, where major residential development projects are well-understood (for example, dormitory renovations) or where residential projects have been proposed in campus planning documents. Therefore, this *2020 Plan* does not include a detailed discussion of population projections for the Town of Mansfield. Such a discussion is more appropriately included in the *Water Supply Plan* for CWC's Western system related to the off-campus areas served by CWC.

Although fluctuations will occur from year to year, UConn's on-campus residential population is dependent upon the available capacity of its housing and the availability of funding for faculty and support staff. At the time of the 2011 *Water Supply Plan*, residential housing was typically overfilled with many lounges and larger rooms being used as "triples" for additional student housing. In recent years, the lowering of UConn's block grant funding from the State has ultimately resulted in the student population growing slower than expected. Thus, residential housing has been operating at unstressed levels. Overall, the year to year fluctuations have occurred within small amounts (5% to 10% of current capacity). The associated water demands have been captured in the recent production and consumption figures.

UConn has identified the following as potential alternatives for expansion of on-campus housing in the foreseeable future, as presented in Table 6-3:

Table 6-3
Potential Future Housing Options

Name	Type	2015 Master Plan Timeframe	Water Supply Plan Timeframe	Estimated Capacity[1]	Service Provider
Mansfield Apartments[2]	Replacement	Future Growth	5-Year (By 2025)	+535	CWC
Honors	New Construction	2015-2020	20-Year (By 2040)	650	UConn
South Hillside	New Construction	2025-2035	20-Year (By 2040)	600	UConn
Hicks/Grange	Expansion	2025-2035	20-Year (By 2040)	+250	UConn
Y-Lot	New Construction	2025-2035	20-Year (By 2040)	900	UConn
West Campus	Replacement	2025-2035	20-Year (By 2040)	+495	UConn
Northwoods Apartments[2]	Replacement or Redevelopment	Future Growth	20-Year (By 2040)	+600	CWC
North and Northwest	Replacement or Redevelopment	Future Growth	50-Year (By 2070)	Unknown	UConn
Husky Village	Replacement or Redevelopment	Future Growth	50-Year (By 2070)	Unknown	UConn
Towers Residence Halls	Replacement or Redevelopment	Future Growth	50-Year (By 2070)	Unknown	UConn
Charter Oaks Apartments and Busby Suites	Replacement or Redevelopment	Future Growth	50-Year (By 2070)	Unknown	UConn
Hilltop Apartments	Replacement or Redevelopment	Future Growth	50-Year (By 2070)	Unknown	UConn

Notes: 1. A "+" denotes additional capacity above current capacity in Table 5-2.
2. Served by CWC now and in the future.

- An Honors Residence Hall in the vicinity of Mirror Lake was in the design phase but has been tabled as the block grant funding from the State has been reduced. This building has been added to the 20-year planning period as shown in Table 6-3.

- The 2015 Campus Master Plan identifies other conceptual potential housing alternatives that have yet to be designed, as presented in Table 6-3. These latter options will be evaluated as necessary to meet on-campus housing needs. These options have been assigned to the 5-year or 20-year planning period in order to estimate potential future demands. Other alternatives, such as replacement of housing in North and Northwest Campus, have yet to be conceptually envisioned and therefore are assumed to occur in the 50-year planning period in this *2020 Plan*. Capacity estimates are not available for these areas at this time.

As the timeframes presented above generally extend past the 5- to 9-year planning timeframe for water supply planning, the next *Water Supply Plan* will likely have updated information about many of these potential projects.

6.4 Projected Water Demands

Recall from Section 1.0 that the subject *2020 Plan* evaluates system performance for the 5-, 20-, and 50-year planning periods corresponding to the years 2025, 2040, and 2070, respectively. Since future water demands must be allocated into the required planning horizons, the following allocations are based on the current understandings associated with the potential demands at the Main Campus and Depot Campus portions of UConn.

Note that Section 6.2.5 discussed UConn's intent to supply water to on-campus growth within its assigned service area, but not to off-campus development which would be supplied by CWC. Over time, it is expected that additional off-campus areas will be supplied by CWC. Therefore, no off-campus demand projections are provided herein.

Note further that although typical water supply plans typically break projected demands down by categories (e.g. residential, commercial, industrial, etc.), that breakdown is not presented herein for several reasons. First, all of UConn's demands could be classified as "institutional demands", although for the purpose of metered consumption residential demands can be readily separated from non-residential consumption. Secondly, the analysis herein draws heavily on the efforts completed by UConn in its 2015 Campus Master Plan, which presents aggregated gross square footage and water demands per square foot, but not a breakdown by categories or by building. Thus, projected water demands are only classified by each campus (Main and Depot) and unaccounted-for water.

6.4.1 Main Campus Projected Demands

Appendix D of the 2015 Campus Master Plan (pages 50 through 52) details the estimated water demands related to the planned Main Campus buildout. Table 6-4 presents the water demand estimates by usage type used in the 2015 Master Plan used to estimate potential flows. Note that new buildings are anticipated to result in additional water demands, while demolition and renovation activities are expected to result in reduced water demands due either to the elimination of the demand or the installation of more water efficient infrastructure in the building.

Table 6-5 presents the usage estimates presented in the 2015 Master Plan for each demand period, both with and without expected conservation measures. Given UConn's commitment to designing and constructing energy efficient buildings that meet a minimum of LEED Silver (LEED Gold preferred) standards, the projected demands with 30% water conservation are not unreasonable for UConn. The 2015 Master Plan notes that renovated buildings were expected to be approximately 30% more water efficient following renovation.

TABLE 6-4
2015 Master Plan Water Demand Estimates by Type

Assumptions	New Buildings (gpd/sf)	Demolition (gpd/sf)	Renovation (gpd/sf)
Academic / Teaching	0.083	-0.108	-0.025
Administration	0.083	-0.108	-0.025
Arts / Culture	0.054	-0.070	-0.016
Athletics & Recreation	0.136	-0.177	-0.041
Miscellaneous	0.000	-0.000	-0.000
Parking	0.000	-0.000	-0.000
Residence / Dining	0.110	-0.143	-0.033
Science	0.137	-0.178	-0.041
Student Services	0.083	-0.108	-0.025
Support / Utility	0.000	-0.000	-0.000

TABLE 6-5
2015 Master Plan Water Demand Estimates for Main Campus

2015 Campus Master Planning Period	Additional Water Demand (No Conservation)	Additional Water Demand (10% Conservation)	Additional Water Demand (20% Conservation)	Additional Water Demand (30% Conservation)
Near-Term Plan (2015-2020)	+115,922 gpd	+104,330 gpd	+92,738 gpd	+81,145 gpd
Mid-Term Plan (2020-2025)	+45,660 gpd	+41,094 gpd	+36,528 gpd	+31,962 gpd
Long-Term Plan (2025-2035)	+132,144 gpd	+118,930 gpd	+105,715 gpd	+92,501 gpd
Total	**+293,726 gpd**	**+264,354 gpd**	**+234,981 gpd**	**+205,608 gpd**

The expected 0.2 to 0.3 mgd increase in water demand at the Main Campus (through the 20-year planning period in this *2020 Plan*) includes potential new buildings, demolitions, and renovations. These are generally shown in Figure 6-1. Although the additional water demand will likely trend towards the lower end (0.2 mgd) due to UConn's water conservation efforts, for the purposes of this *2020 Plan* the more conservative figures will be utilized. Note the following:

- The 2015 Master Plan notes that these water demand estimates do not anticipate future buildout at the Depot Campus (these are in the next subsection below).

- Secondly, the near-term plan includes some demands that have already been realized (but are presently unmetered). Leaving the estimated demands from the 2015 Campus Master Plan in place for those buildings is considered conservative. Additionally, given the slowdown in new construction the mid-term planned demands have been pushed to the 20-year planning period.

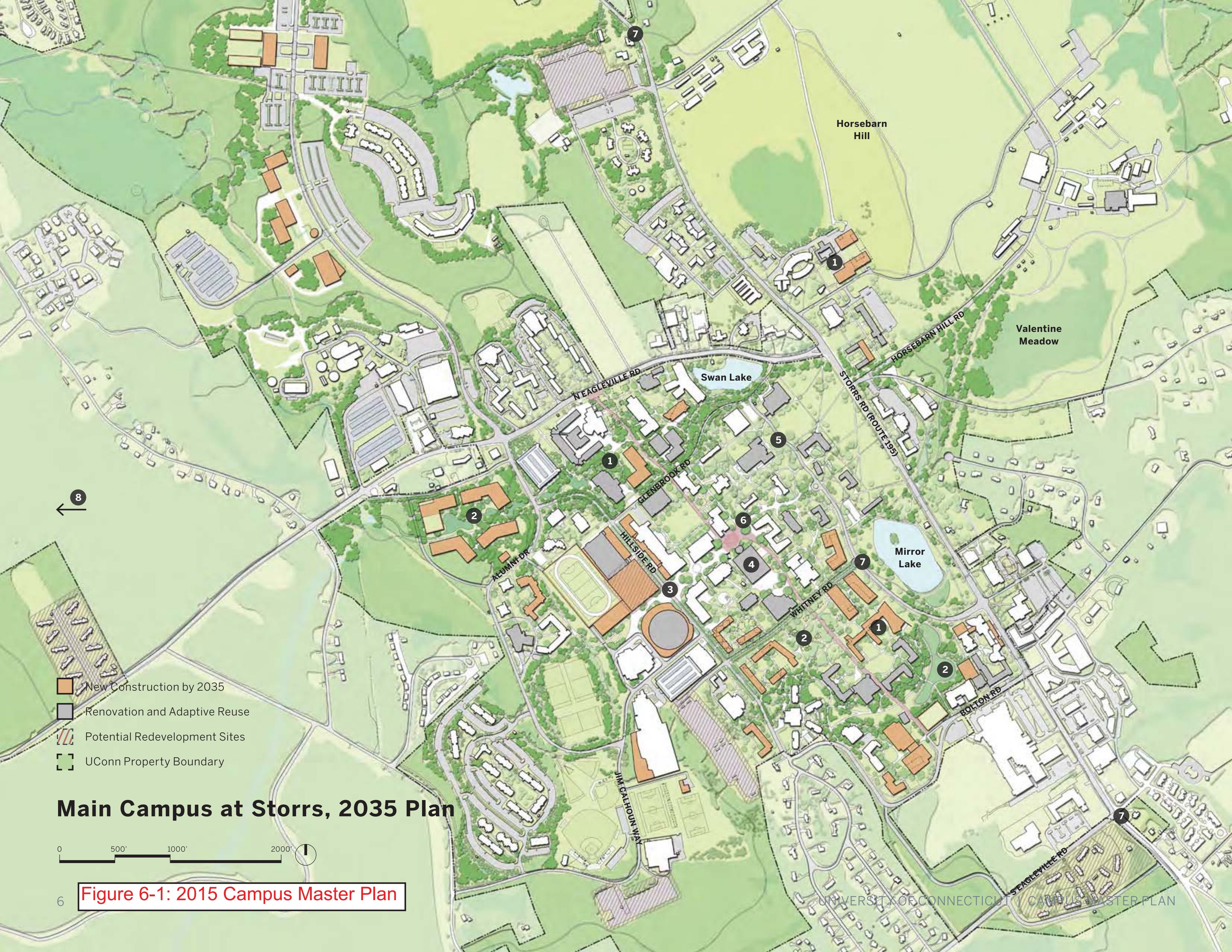

Figure 6-1: 2015 Campus Master Plan

- Furthermore, the 2015 Campus Master Plan water demand estimates included off-campus demands (e.g., replacement of Mansfield Apartments) that are now the responsibility of CWC. As an exact breakdown of projections between what is served by UConn and what is now served by CWC is not available, these conservatively high estimates will be used for the purpose of this *2020 Plan*.

- Finally, note that development in the Technology Park area that is owned by UConn will be supplied by the UConn water system; however, development in the Technology Park area that is owned by private entities, or ownership is shared between UConn and private entities, would be served by CWC through the interconnection. Therefore, projected water demand in the Technology Park area may be less than those identified in the 2015 Campus Master Plan if private developers participate in the growth that occurs in this area over the mid- and long-term horizons.

6.4.2 Depot Campus Projected Demands

Potential demands for the Depot Campus were estimated in the 2002 Town of Mansfield *Water Supply Plan* on a parcel-by-parcel basis, utilizing the previously-available notations of "Parcel 1" through "Parcel 7" in the 2000 Outlying Parcels Master Plan and taking into account the square footage of existing buildings that will remain on-site, as well as square footage of proposed buildings that may be developed. Water demand was not estimated for existing occupied buildings (such as Parcels 3 and 5), because these already use water from the existing supply. Figure 6-2 presents the generalized buildout model for each parcel on the Depot Campus.

The Center for Clean Energy Engineering ("Enterprise Building") was constructed on Parcel 2 in 2001. This metered building currently has a water demand of approximately 350 gpd. Thus, the previous calculation for Parcel 2 has been revised downward by 350 gpd. Based on these estimates, a water demand of 94,950 gpd for the potential redevelopment activities was calculated. Table 6-6 provides a breakdown of the parcels and their respective square footage and water demand.

Given the lack of information about potential use for many of these properties, these water demands were calculated based on the DPH septic system design standard of 0.1 gpd/sf. UConn recognizes that applying a multiplier of 0.1 gpd/sf is not the most ideal means of estimating water demands (as shown by the variability in Table 6-4 used for the 2015 Campus Master Plan). However, until such time that specific plans are in place for any one of the Depot Campus parcels, the estimate of 94,950 gpd is the most reasonable figure to use for planning purposes.

Furthermore, note that while the individual parcels associated with the Depot Campus will likely be redeveloped one at a time, the exact sequence and timing is largely not known at this time. Note that a potential expansion of the Center for Clean Energy Engineering is already in the planning stages. Therefore, the demands in Table 6-6 for Parcel 2 has been placed in the 5-year planning horizon.

Finally, the former Bergin Correctional Facility closed in 2011 and the Connecticut DOC transferred the property to UConn in 2015. This facility previously had a water demand of approximately 78,000 gpd. UConn presently does not have any redevelopment plans for this property. For the purposes of this *2020 Plan*, the 157,629 gross square feet of building area is assumed to have a future water demand of 15,800 gpd consistent with the above design standard.

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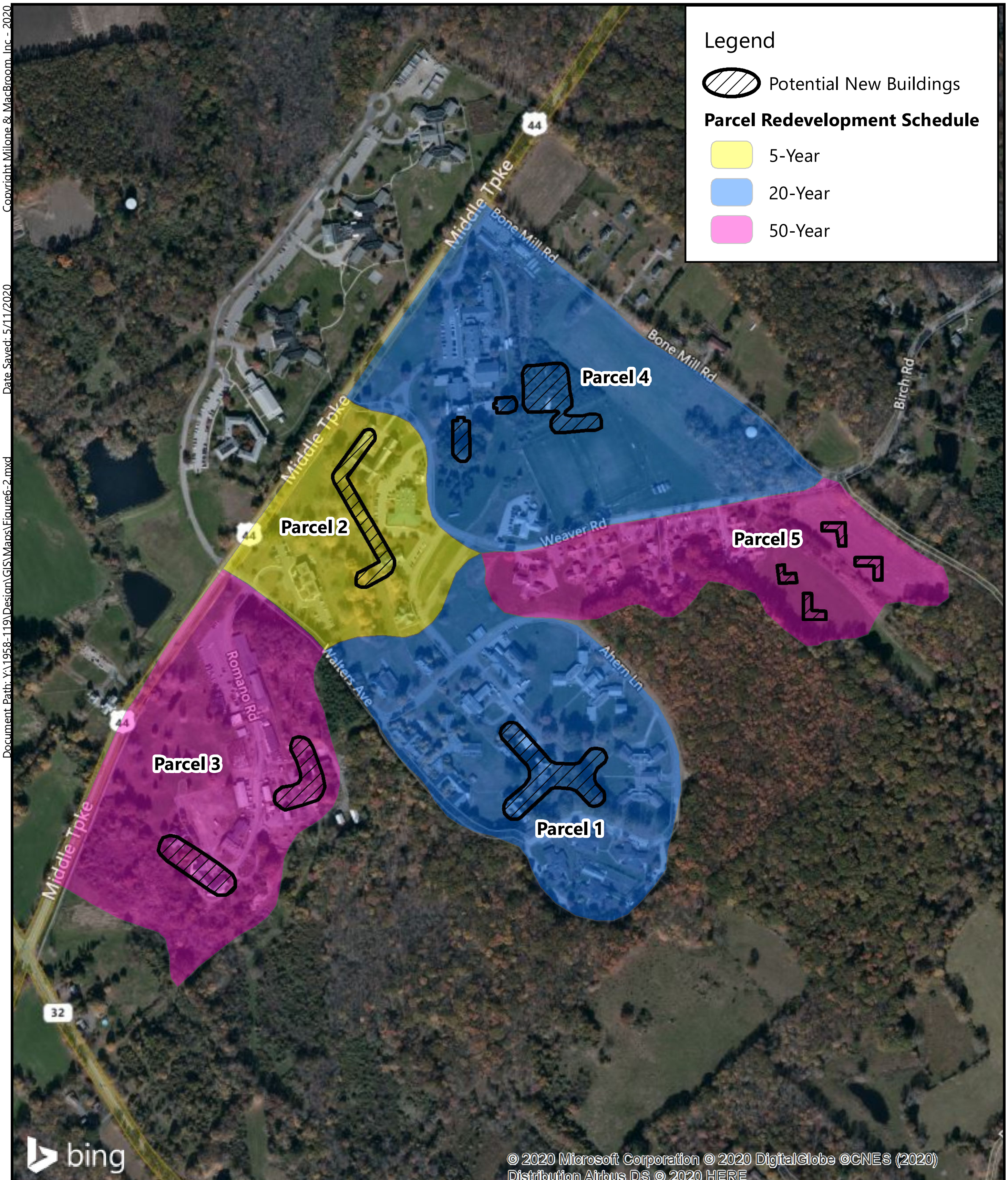

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DEPOT CAMPUS FUTURE REDEVELOPMENT

WATER SUPPLY PLAN
UNIVERSITY OF CONNECTICUT
DEPOT CAMPUS
MANSFIELD, CT

N

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Feet

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DATE 5/11/2020
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FIG. 6-2

TABLE 6-6
Depot Campus Water Demand Estimates

Parcel	Building Square Footage	Average Day Water Demand Estimate
1	315,000	31,500 gpd
1B	48,800	4,900 gpd
2	135,000	13,500 gpd
2	Enterprise Building	-350 gpd
2C	23,300	2,300 gpd
3 & 3B	96,000	9,600 gpd
4 & 4B	255,000	25,500 gpd
5	Currently occupied	No new water demand
5B	80,000	8,000 gpd
	Depot Campus Subtotal	94,950 gpd
	Former Bergin Facility	15,800 gpd
	Total	**110,750 gpd**

For the purposes of this *2020 Plan*, and in light of the lack of any other specific plans for the Depot Campus under consideration by UConn, the 15,450 gpd from Parcel 2 has been assigned to the 5-year planning period. Half of the remaining demand (47,650 gpd) has been assigned to the 20-year planning period, with the remainder (47,650 gpd) assigned to the 50-year planning period.

6.4.3 Unaccounted-For Water

Recall from Section 5.4 that the average daily metered water consumption from 2017-2019 in was approximately equal to 86% of average daily production over that same time period. Therefore, on average, 14% of UConn's produced water is a combination of (1) distributed water that is consumed by non-metered uses; and (2) transmitted/distributed water that is truly unaccounted-for or lost. Thus, it is believed that UConn's true "unaccounted-for water" amount is much less than 14% of total production. This is consistent with the 2011 *Water Supply Plan*, where the average daily metered water consumption from 2007-2009 was metered at 85% of total production.

The improvement schedules presented in Section 7.0 (and in the *Water Conservation Plan*) include new and upgraded metering as well as planned improvements for the ongoing metering program, annual water audits, and leak detection surveys to assess unaccounted-for water. These efforts are anticipated to maintain unaccounted-for water at levels far below the industry standard of 15% of total production. Similar to the 2011 *Water Supply Plan*, this *2020 Plan* assumes that 5% of the water needed for future committed demands will be truly unaccounted-for and provides for this increment in the projections below.

6.4.4 Seasonality and Peaking Factors

Note that the previous tables provide ADD figures and do not account for seasonality or peaking factors. Any future water consumption by UConn is expected to exhibit a seasonality similar to that already experienced by the UConn water system. These water use patterns essentially require a monthly basis for analysis.

Table 6-7 provides the seasonality factors for 2017 through 2019 (the period after the CWC interconnection was in place and former UConn off-campus customers were being served by CWC). These are based on the ratio of monthly potable water production to the total annual potable water production. Non-potable water demands have been excluded from this calculation in order to ensure that the seasonality factors for the future potable water demands are as realistic as possible.

TABLE 6-7
Monthly Seasonality of Potable Water Production, 2017-2019

Month	2017	2018	2019
January	94.9%	93.7%	75.7%
February	111.9%	89.6%	107.3%
March	106.5%	101.9%	108.0%
April	121.0%	123.1%	116.9%
May	83.1%	79.9%	76.3%
June	82.9%	75.8%	61.5%
July	92.9%	89.5%	91.3%
August	101.7%	110.9%	111.0%
September	**128.0%**	**126.9%**	**139.9%**
October	107.1%	115.0%	127.9%
November	78.9%	96.6%	92.5%
December	68.7%	74.4%	69.2%

Note: Figures in bold are monthly maximums for each year.

Seasonality factors typically range from a low of approximately 60%-80% in the early summer (the average monthly potable water demand is only 60%-80% of the annual average) to a high of approximately 140% in September, 130% in October, and 120% in April. This is reasonable, as the greatest water demand occurs when students are present during months without lengthy vacations. During these times, they are occupying housing and utilizing UConn facilities to the greatest extent possible.

Historic MMADD and PDD for the potable water system were obtained from production records in Section 5.3. Ratios of MMADD to ADD and PDD to ADD are presented in Table 6-8 for the last three years. In order to be conservative, the greatest maximum month ratio (1.40 from September 2019) will be carried forward in the projections, as will the highest peak day ratio (2.30 from 2018) from the last three years.

TABLE 6-8
Peak Demand Analysis

Year	ADD (mgd)	MMADD (mgd)	PDD (MG)	Maximum Month Ratio (MMADD/ADD)	Peak Day Ratio (PDD/ADD)
2017	0.897	1.148	1.777	1.28	1.98
2018	0.752	0.955	1.731	1.27	**2.30**
2019	0.723	1.012	1.440	**1.40**	1.99
Average	**0.791**	1.038	1.649	1.32	2.09

Note: Bold text indicates figure used for projections.

6.4.5 Summary of Projected Demands

Table 6-9 summarizes the allocation of future water demands into the planning horizons.

TABLE 6-9
Allocation of Water Demand Estimates

Description	5-Year By 2025	20-Year By 2040	50-Year By 2070
Main Campus	+115,922 gpd	+177,804 gpd	+0 gpd
Depot Campus	+15,450 gpd	+47,650 gpd	+47,650 gpd
Unaccounted-For Water (5%)	+6,569 gpd	+11,273 gpd	+2,383 gpd
Totals	**+137,941 gpd**	**+236,727 gpd**	**+50,033 gpd**

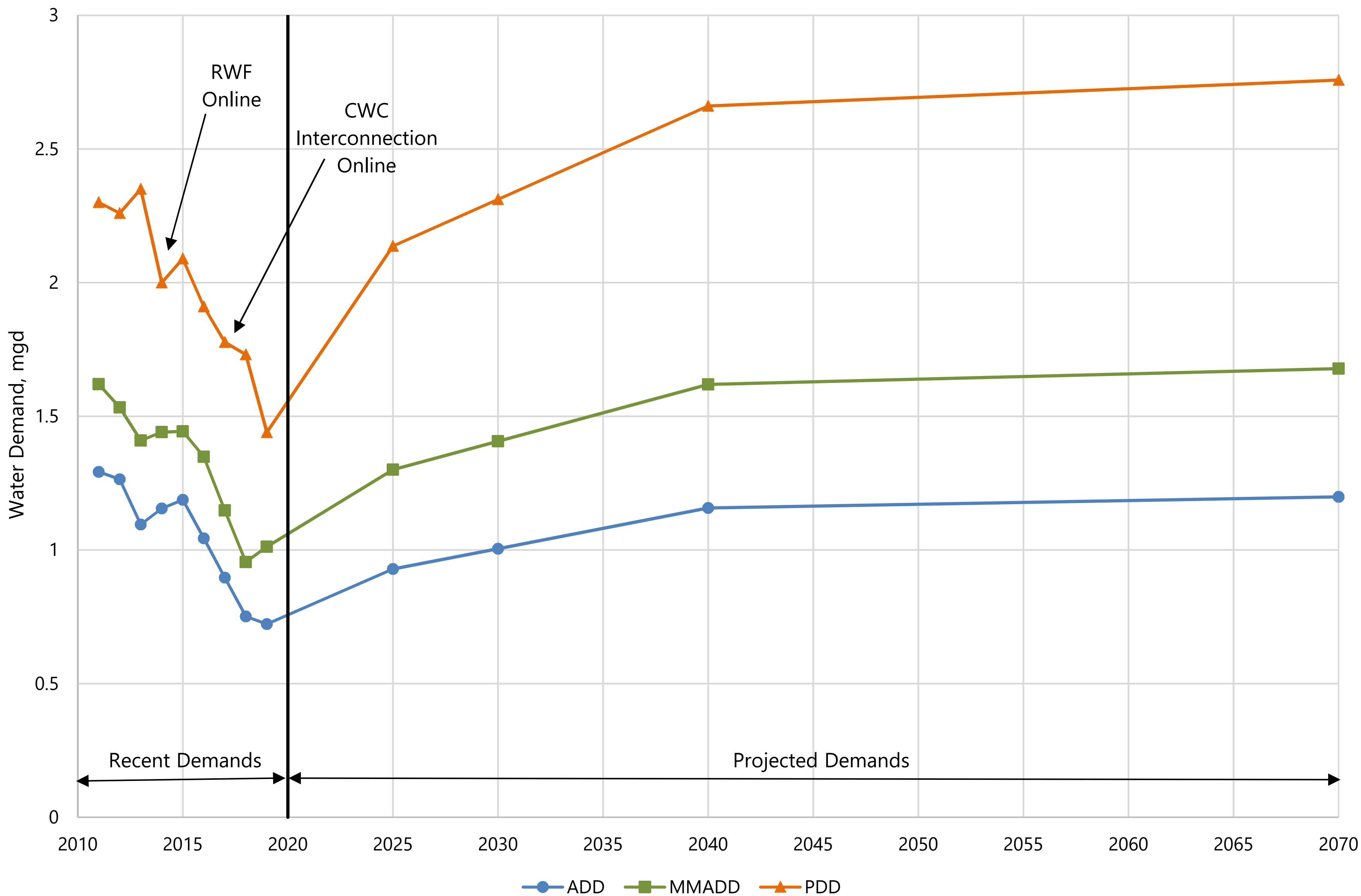
A summary of projected ADD, MMADD, and PDD is given in Table 6-10 for the 5-year, 20-year, and 50-year planning periods. These projections use the average 2017-2019 ADD condition in Table 6-8 (0.791 mgd) as a base, as well as the 1.40 and 2.30 peaking factors identified in Section 6.4.4. These projections are shown graphically in Figure 6-3.

TABLE 6-10
Summary of ADD, MMADD, and PDD Projections

Year	Projected ADD (mgd)	Projected MMADD (mgd)	Projected PDD (MG)
2025	0.929	1.301	2.137
2030	1.008	1.411	2.318
2040	1.166	1.632	2.681
2070	1.216	1.702	2.796

*Note: 2030 (10-year) demands interpolated from 2025 and 2040 projected demands.

Figure 6-3
Recent and Projected Water Demands



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These projections are discussed in the context of available supplies and margin of safety in Section 7.0 of this *2020 Plan*. Note that these projections will be updated in the next *Water Supply Plan* update, expected to be within nine years from the date of this *2020 Plan*.

7.0 ASSESSMENT AND SELECTION OF ALTERNATIVES

7.1 Projected Margins of Safety

Projected water demands are presented in Section 6.4 of this *2020 Plan* (Table 6-6) based primarily on the 2015 Campus Master Plan. Projected margins of safety are discussed herein. Recall from Section 3.0 that UConn has bolstered its margin of safety since completion of the 2011 *Water Supply Plan* through the completion of the RWF (by reducing potable water demands) and the CWC interconnection (by reducing potable water demands and increasing available supply), as well as through further studies of Fenton River Well D (providing source redundancy when a well is offline).

Table 7-1 presents the margins of safety for the UConn water system for 2025, 2030, 2040, and 2070 without consideration of any potential future supplies. These margins of safety are based on the available water calculated on the DPH worksheet (Appendix H) and the smallest available water value with the largest well offline.

TABLE 7-1
Projected Margins of Safety

Year	Total Available Supply (mgd)	Projected ADD (mgd)	Margin of Safety for ADD	Projected MMADD (mgd)	Margin of Safety for MMADD	Projected PDD (mgd)	Margin of Safety for PDD
Normal Operation							
2025	3.648	0.929	3.93	1.301	2.80	2.137	1.71
2030	3.648	1.008	3.62	1.411	2.59	2.318	1.57
2040	3.648	1.166	3.13	1.632	2.24	2.681	1.36
2070	3.648	1.216	3.00	1.702	2.14	2.796	1.30
Largest Well Offline							
2025	2.973	0.929	3.20	1.301	2.29	2.137	1.39
2030	2.973	1.008	2.95	1.411	2.11	2.318	1.28
2040	2.973	1.166	2.55	1.632	1.82	2.681	1.11
2070	2.973	1.216	2.45	1.702	1.75	2.796	1.06

Note: Highlighted cells are less than the recommended margin of safety of 1.15.

Margin of safety for the UConn water system will decrease as future demands are realized in the system. Margin of safety for all demand scenarios will remain above 1.15 until 2040, at such time that margin of safety to meet PDD will fall below 1.15 under the largest well offline scenario. However, as the margin of safety to meet PDD under the largest well offline scenario does not fall below 1.0, Table 7-1 demonstrates that sufficient redundant supply is presently available to the system.

Tables 7-2, 7-3, and 7-4 present the monthly margins of safety for the UConn water system for the 5-year (2025), 20-year (2040), and 50-year (2070) planning periods without consideration of any potential future supplies. Monthly demands were calculated using the 2019 monthly seasonality of potable water production in Table 6-5. Note that when considering monthly water availability for the largest well offline scenario, additional supply is provided by Fenton Well D during the maximum month of demand (September); thus, margin of safety values for the maximum month (September) presented in Tables 7-2, 7-3, and 7-4 will differ from the standardized value required by DPH in Table 7-1.

TABLE 7-2
Projected Monthly Margins of Safety, 2025

Month	Projected Monthly ADD (mgd)	Total Available Supply (mgd)	Margin of Safety	Total Available Supply with Largest Well Offline (mgd)	Margin of Safety
January	0.703	4.512	6.42	3.387	4.82
February	0.997	4.512	4.53	3.387	3.40
March	1.003	4.512	4.50	3.387	3.38
April	1.086	4.512	4.15	3.387	3.12
May	0.709	4.512	6.37	3.387	4.78
June	0.571	3.648	6.39	2.973	5.20
July	0.848	3.648	4.30	2.973	3.51
August	1.031	3.648	3.54	2.973	2.88
September	1.300	3.648	2.81	3.186	2.45
October	1.188	3.648	3.07	3.186	2.68
November	0.859	4.512	5.25	3.387	3.94
December	0.643	4.512	7.02	3.387	5.27
Annual	**0.929**	**3.648**	**3.93**	**2.973**	**3.20**

TABLE 7-3
Projected Monthly Margins of Safety, 2040

Month	Projected Water Demand (mgd)	Total Available Supply (mgd)	Margin of Safety	Total Available Supply with Largest Well Offline (mgd)	Margin of Safety
January	0.882	4.512	5.11	3.387	3.84
February	1.251	4.512	3.61	3.387	2.71
March	1.259	4.512	3.58	3.387	2.69
April	1.363	4.512	3.31	3.387	2.49
May	0.889	4.512	5.07	3.387	3.81
June	0.717	3.648	5.09	2.973	4.15
July	1.064	3.648	3.43	2.973	2.79
August	1.294	3.648	2.82	2.973	2.30
September	1.631	3.648	2.24	3.186	1.95
October	1.491	3.648	2.45	3.186	2.14
November	1.078	4.512	4.18	3.387	3.14
December	0.807	4.512	5.59	3.387	4.20
Annual	**1.166**	**3.648**	**3.13**	**2.973**	**2.45**

TABLE 7-4
Projected Monthly Margins of Safety, 2070

Month	Projected Water Demand (mgd)	Total Available Supply (mgd)	Margin of Safety	Total Available Supply with Largest Well Offline (mgd)	Margin of Safety
January	0.920	4.512	4.97	3.387	3.73
February	1.305	4.512	3.51	3.387	2.63
March	1.313	4.512	3.48	3.387	2.61
April	1.421	4.512	3.22	3.387	2.42
May	0.928	4.512	4.93	3.387	3.70
June	0.748	3.648	4.95	2.973	4.03
July	1.110	3.648	3.33	2.973	2.72
August	1.349	3.648	2.74	2.973	2.23
September	1.701	3.648	2.18	3.186	1.90
October	1.555	3.648	2.38	3.186	2.08
November	1.125	4.512	4.07	3.387	3.05
December	0.841	4.512	5.44	3.387	4.08
Annual	**1.216**	**3.648**	**3.00**	**2.973**	**2.45**

Similar to the results in Table 7-1, the monthly margins of safety for each demand scenario are above 1.15. Therefore, current projections do not suggest that the UConn water system will need additional sources of supply at this time. Nevertheless, a discussion of potential ways to increase margin of safety in the UConn system is presented below should actual demand trend higher than projected demand in the near future.

7.2 Assessment of Alternative Water Supplies

Although the margin of safety analysis in this *2020 Plan* does not indicate that new supply sources will be needed by UConn to meet projected demands, UConn understands that its internal planning processes are extremely dynamic and subject to change. For example, the 2015 Campus Master Plan identified this potential through scenarios where student enrollment increased by either 1,000 students or even 4,000 students over the next 20 years. Given that campus master plans are typically updated every 20 years and water supply plans are typically updated on a 5- to 9-year cycle, UConn must be prepared if increased demands are realized.

The most feasible alternatives for maintaining appropriate system margin of safety include the following options:

- Continue to design new buildings to meet high-efficiency water use standards (reduces future demands);
- Increase the use of treated effluent to supply non-potable needs across campus (reduces future demands);
- Increasing the amount of online / distance learning courses available to students to reduce commuter trips to campus (reduces future demands); and
- If necessary, increase contractual allotment of water and increase purchases from CWC.

Other alternative supply sources identified in the 2011 *Water Supply Plan* are not considered to be prudent at this time but may become prudent in the future. Those are also summarized below.

7.2.1 Continue Water Conservation Efforts in New Design

As noted in the 2015 Campus Master Plan, UConn has the potential for reducing future demands through the installation of high-efficiency water infrastructure as part of new building construction and building renovations. The Master Plan estimated that savings of up to 30% could be realized through the use of such fixtures as well as connection to the RWF for non-potable water uses such as toilet flushing. The benefits of reducing new demands by 10%, 20%, and 30% is presented in Tables 7-5, 7-6, and 7-7.

TABLE 7-5
Projected Margins of Safety with New Demand Reduced by 10%

Year	Total Available Supply (mgd)	Projected ADD (mgd)	Margin of Safety for ADD	Projected MMADD (mgd)	Margin of Safety for MMADD	Projected PDD (mgd)	Margin of Safety for PDD
Normal Operation							
2025	3.648	0.915	3.99	1.281	2.85	2.105	1.73
2030	3.648	0.986	3.70	1.381	2.64	2.268	1.61
2040	3.648	1.128	3.23	1.579	2.31	2.595	1.41
2070	3.648	1.173	3.11	1.643	2.22	2.699	1.35
Largest Well Offline							
2025	2.973	0.915	3.25	1.281	2.32	2.105	1.41
2030	2.973	0.986	3.01	1.381	2.15	2.268	1.31
2040	2.973	1.128	2.64	1.579	1.88	2.595	1.15
2070	2.973	1.173	2.53	1.643	1.81	2.699	1.10

Note: Highlighted cells are less than the recommended margin of safety of 1.15.

TABLE 7-6
Projected Margins of Safety with New Demand Reduced by 20%

Year	Total Available Supply (mgd)	Projected ADD (mgd)	Margin of Safety for ADD	Projected MMADD (mgd)	Margin of Safety for MMADD	Projected PDD (mgd)	Margin of Safety for PDD
Normal Operation							
2025	3.648	0.901	4.05	1.262	2.89	2.073	1.76
2030	3.648	0.964	3.78	1.350	2.70	2.218	1.64
2040	3.648	1.091	3.34	1.527	2.39	2.509	1.45
2070	3.648	1.131	3.23	1.583	2.30	2.601	1.40
Largest Well Offline							
2025	2.973	0.901	3.30	1.262	2.36	2.073	1.43
2030	2.973	0.964	3.08	1.350	2.20	2.218	1.34
2040	2.973	1.091	2.73	1.527	1.95	2.509	1.19
2070	2.973	1.131	2.63	1.583	1.88	2.601	1.14

TABLE 7-7
Projected Margins of Safety with New Demand Reduced by 30%

Year	Total Available Supply (mgd)	Projected ADD (mgd)	Margin of Safety for ADD	Projected MMADD (mgd)	Margin of Safety for MMADD	Projected PDD (mgd)	Margin of Safety for PDD
Normal Operation							
2025	3.648	0.888	4.11	1.243	2.94	2.041	1.79
2030	3.648	0.943	3.87	1.320	2.76	2.168	1.68
2040	3.648	1.053	3.46	1.475	2.47	2.423	1.51
2070	3.648	1.088	3.35	1.524	2.39	2.504	1.46
Largest Well Offline							
2025	2.973	0.888	3.35	1.243	2.39	2.041	1.46
2030	2.973	0.943	3.15	1.320	2.25	2.168	1.37
2040	2.973	1.053	2.82	1.475	2.02	2.423	1.23
2070	2.973	1.088	2.73	1.524	1.95	2.504	1.19

As demonstrated in the tables above, meeting a water conservation goal of 30% for new development and redevelopment would ensure that system margin of safety remains above 1.15 for all demand scenarios through 2070 including when the largest well is offline. This will help to ensure that new sources of supply are not necessary for the foreseeable future. However, as noted in the 2015 Campus Master Plan, UConn will continue to strive for as much water efficiency as possible.

7.2.2 Increase Use of Treated Effluent

In addition to installing grey water infrastructure in new and renovated buildings, UConn could also begin retrofitting other buildings not slated for renovation. This would require a more immediate expansion of the grey water system across campus than is currently planned, although in the short-term buildings close to current grey water lines (such as those near the CUP) could be outfitted.

As noted in Section 3.2.3, the present RWF has a maximum capacity of 1.0 mgd. A cursory examination of the RWF flows to the campus in Section 5.2.2 suggests that the current non-potable water flow is approximately 0.33 mgd, with a peak day peaking factor (based on the March 2017 historic peak) of 1.95. Therefore, the maximum average daily flow that could be maintained is approximately 0.51 mgd while maintaining supply for peak flows. This suggests that approximately 0.18 mgd of additional non-potable water demands over the 2019 average daily flow level could be met by the existing RWF. Note that some of this capacity will be taken up by new construction and renovations discussed Section 7.2.1. Regardless of the demand source, the net result will be reduced demand on the potable water system.

UConn will need to study potential expansion options for the campus grey water system in order to fully allocate the flow from the RWF. Potential expansion of the RWF may also be an option in the future if sufficient need materializes (such as in response to a public-private partnership that requires a high non-potable water demand in the Technology Park or the Depot Campus. However, expansion of the RWF is not believed to be necessary to meet the projected non-potable water demands at this time.

7.2.3 Increase Availability of Online & Distance Learning Classes

While it is not immediately clear what percentage of UConn's water demand can be directly applied to commuting students and faculty, it is believed that some percentage of water savings could be achieved by increasing the number of classes that can be completed via distance learning. As demonstrated during the COVID-19 pandemic, many of UConn's lecture courses may be completed online. Furthermore, while many classes have laboratory or testing components that require in-person attendance, even if one lecture per week for each class could be held online there would likely be a resultant reduction in overall water demand.

The 2015 Campus Master Plan identifies a variety of current, near-term, and long-term strategies for reducing UConn's carbon footprint and overall water use. These strategies included consideration for the potential need for more students (1,000 to 4,000) living and learning on campus. In addition to the suggested strategies to mitigate the potential impacts of that population increase, increased use of distance learning could also be applied to help reduce peak parking needs, reduce single-occupant vehicle trips to campus, and reduce overall carbon emissions (from those trips). The Office of Sustainability should consider the potential feasibility of this option in more detail as it may have campus-wide effects.

7.2.4 Increase Contractual Allotment from The Connecticut Water Company

Whereas the previous options dealt primarily with methods for decreasing demands, UConn's most feasible option for significantly increasing available supply would be to negotiate with CWC for a higher guaranteed contractual volume than the current 1.5 mgd.

According to the *Coordinated Water System Plan, Part III – Final Integrated Report* published in June 2018 for the Central PWSMA, the CWC Western system is expected to still have a surplus of approximately 6.4 mgd in 2060. At this time, it appears that requesting additional supply from CWC in the future will be feasible should the need arise. Furthermore, given that the interconnection is already in place, this may also be UConn's most prudent option from a cost perspective.

7.2.5 Other Sources of New Supply Not Considered Prudent at this Time

The 2011 *Water Supply Plan* presented a detailed list of potential options for securing additional water supply for UConn[23]. Many were more fully evaluated in UConn's *Potential New Sources of Water Supply* EIE in 2012[24] which ultimately resulted in UConn pursing the CWC interconnection. The reader is directed to those documents for a detailed description of the analysis provided for each option. A brief discussion of why these options are no longer considered to be feasible or prudent at this time is presented below:

- Relocation of Fenton Well A: Replacement of Well A with a deeper well was originally evaluated as part of the

[23] https://envpolicy.uconn.edu/reports-projects-plans/
[24] https://portal.ct.gov/CEQ/Environmental-Monitor/Environmental-Monitor-Archives/2012/November-20-2012

Fenton River Study with the conclusion that induced infiltration from the river would only be minimally reduced. Furthermore, given that Well A is subject to the recommendations of the Fenton River Study which were ultimately used in the *Wellfield Management Plan*, relocating and reactivating Well A would not increase available water. Finally, as Wells B, C, and D can already produce more than the water diversion registration of 864,000 gpd, maintaining Well A will continue to provide much needed resiliency and ensure continuity of operation in the event that another well was offline. Thus, given the status of Well A in its current classification as an emergency well, relocating Well A is neither feasible for increasing available supply nor prudent from a cost perspective.

- Increase Withdrawals from Existing Wellfields: One option that UConn has long been aware of is the potential for increasing withdrawals from its current wellfields. For example, previous studies conducted in the late 1960s evaluated the potential for several additional wells at the Willimantic River Wellfield than are presently installed. Installing new wells at either wellfield for use would require a water diversion permit from DEEP. Securing such a permit for a withdrawal above the registered value for either wellfield may be feasible provided UConn agrees to abide by, at a minimum, the operating strategies promulgated in the Fenton River Study and/or Willimantic River Study as presented in the *Wellfield Management Plan*. Note that any permit application would likely require revisiting the related Instream Flow Study in order to determine potential fisheries impacts from the higher rates of withdrawal, with appropriate adjustment of the existing trigger discharges. Furthermore, note that a new well at the Fenton River Wellfield is unlikely to increase available water (or margin of safety) as there would still be a period of each year where the wellfield would be expected to be shut down. Thus, a new well at the Fenton River Wellfield would only provide additional redundant supply during certain months of the year, while a new well at the Willimantic River Wellfield may provide an additional increment of supply, available water, and margin of safety.

- Interconnection with Windham Water Works: Although this interconnection was identified in the 2018 *Coordinated Water System Plan, Part III – Final Integrated Report* as a potential regional interconnection option, it was identified as an option for providing a redundant source of supply to Windham Water Works as opposed to providing a source of supply to UConn. Nevertheless, the potential still exists that water from Windham Water Works could provide a future increment of supply to UConn. However, as discussed in the 2012 EIE, the same issues surrounding provision of instream flow, permitting, and funding of water treatment plant upgrades and construction costs would need to be overcome. As it is believed that Windham Water Works does not currently have sufficient excess supply to provide a large increment of water to UConn, this alternative is not considered to be either feasible or prudent at this time.

- Interconnection with Tolland Water Department: Given that Tolland Water Department also connected to the CWC Western system as part of the water main extension from Tolland to Mansfield, and that their interconnection was performed, in part, to reduce demand on Tolland's sources of supply, connection to Tolland Water Department to increase UConn's available supply continues to not be feasible.

- New Stratified Drift Wellfields: The 2012 EIE evaluated multiple options for new stratified drift wells along the Willimantic River and the Fenton River away from the existing wellfields, and the evaluation included test borings at certain locations. Ultimately, the individual and cumulative yields from these potential wellfields were considered insufficient to meet future UConn demands at that time, and the distance involved to move that water to the UConn water system was expected to be costly. A copy of the summary describing these sources is presented in Appendix O. UConn may reconsider some of these locations in the future to provide a small increment of additional available supply, but these are not considered to be necessary or prudent at this time.

7.3 System Improvements and Maintenance Activities

Source and system improvements have been identified and described in detail throughout this *2020 Plan*. The improvement schedules summarized in Tables 7-8, 7-9, and 7-10 relate these recommended improvements to the time frame in which they are believed to be necessary. The Short-, Intermediate-, and Long-Term Improvement Schedules correspond to the 5-, 20-, and 50-year planning periods. Cost estimates, financing sources, and the year in which each is anticipated to occur are also listed.

Note that these improvement schedules are general and for planning purposes only. The timing of specific projects will continue to be evaluated and scheduled under UConn's Capital Improvement Program with coordination and advice from its contract operator.

TABLE 7-8
Short Term Improvement Schedule, 2020-2025

Item	Estimated Cost	Year	Funding Source
Continue metering of service connections and groups of buildings	$100,000	2020-2025	OB
Replace Hillside Road water main	$200,000	2020-2025	CI
Additional hydraulic model calibration and expansion as needed	$50,000	2020-2025	OB
Storage tank inspections	$20,000	2020-2025	OB
Update Rules and Regulations for Water Service	NA	2020-2025	OB
Repair main breaks as needed	$5,000/yr	As Needed	OB
Repair leaking services as needed	$5,000/yr	As Needed	OB
Meter testing/calibration/replacement program	$5,000/yr	Annually	OB
Annual water balance and conservation programs	NA	Annually	OB
Leak detection survey	NA	2021	OB

Notes: CI = Capital Improvement funds, OB = Operating Budget, OS = Outside Sources
Cost estimates are for planning purposes only. Where an estimated cost "NA" (Not Applicable) is shown, this work is intended to be conducted by in-house staff or paid for by other departments.

TABLE 7-9
Intermediate Term Improvement Schedule, 2026-2040

Item	Estimated Cost	Year	Funding Source
More fully interconnect the Depot Campus sub-system with the Main Campus sub-system such that the Fenton River Wellfield and CWC interconnection could provide water during emergencies	$700,000	2026-2040	CI
More fully interconnect the Main Campus/CWC system in areas such as Discovery Drive and South Eagleville Road.	$700,000	2026-2040	CI/OS
Demolish inactive water storage tanks near 0.75 MG tank at Depot Campus	$100,000	2026-2040	CI
Redevelop wells as needed	$20,000-$50,000 ea	Various	OB
Storage tank inspections	$7,000 ea	Various	OB
Repair main breaks as needed	$5,000/yr	As Needed	OB
Repair leaking services as needed	$5,000/yr	As Needed	OB
Meter testing/calibration/replacement program	$5,000/yr	Annually	OB
Annual water balance and conservation programs	NA	Annually	OB
Leak detection survey	NA	2026, 2031, 2036	OB
Inspect and maintain storage facilities	$50,000	Various	OB
Update *Water Supply Plan*	$50,000/ea	2029, 2038	OB
Extend campus grey water system (Werth Residence Hall, Science I, and near other areas where there is reclaimed water infrastructure)	TBD	2026	CI/OB

Note: TBD = To Be Determined
Cost estimates are for planning purposes only. Where an estimated cost "NA" is shown, this work is intended to be conducted by in-house staff or paid for by other departments.

TABLE 7-10
Long Term Improvement Schedule, –2041-2070

Item	Estimated Cost	Year	Funding Source
Redevelop wells as needed	$20,000-$50,000 ea.	Various	OB
Storage tank inspections	$7,000 ea	Various	OB
Repair main breaks as needed	$5,000/yr	As Needed	OB
Repair leaking services as needed	$5,000/yr	As Needed	OB
Meter testing/calibration/replacement program	$5,000/yr	Annually	OB
Annual water balance and conservation programs	NA	Annually	OB
Leak detection survey	NA	2041, 2046, 2051, 2056, 2061, 2066	OB
Inspect and maintain storage facilities	$50,000	Various	OB
Update *Water Supply Plan*	$50,000/ea	2047, 2056, 2065	OB

Cost estimates are for planning purposes only. Where an estimated cost "NA" is shown, this work is intended to be conducted by in-house staff or paid for by other departments.

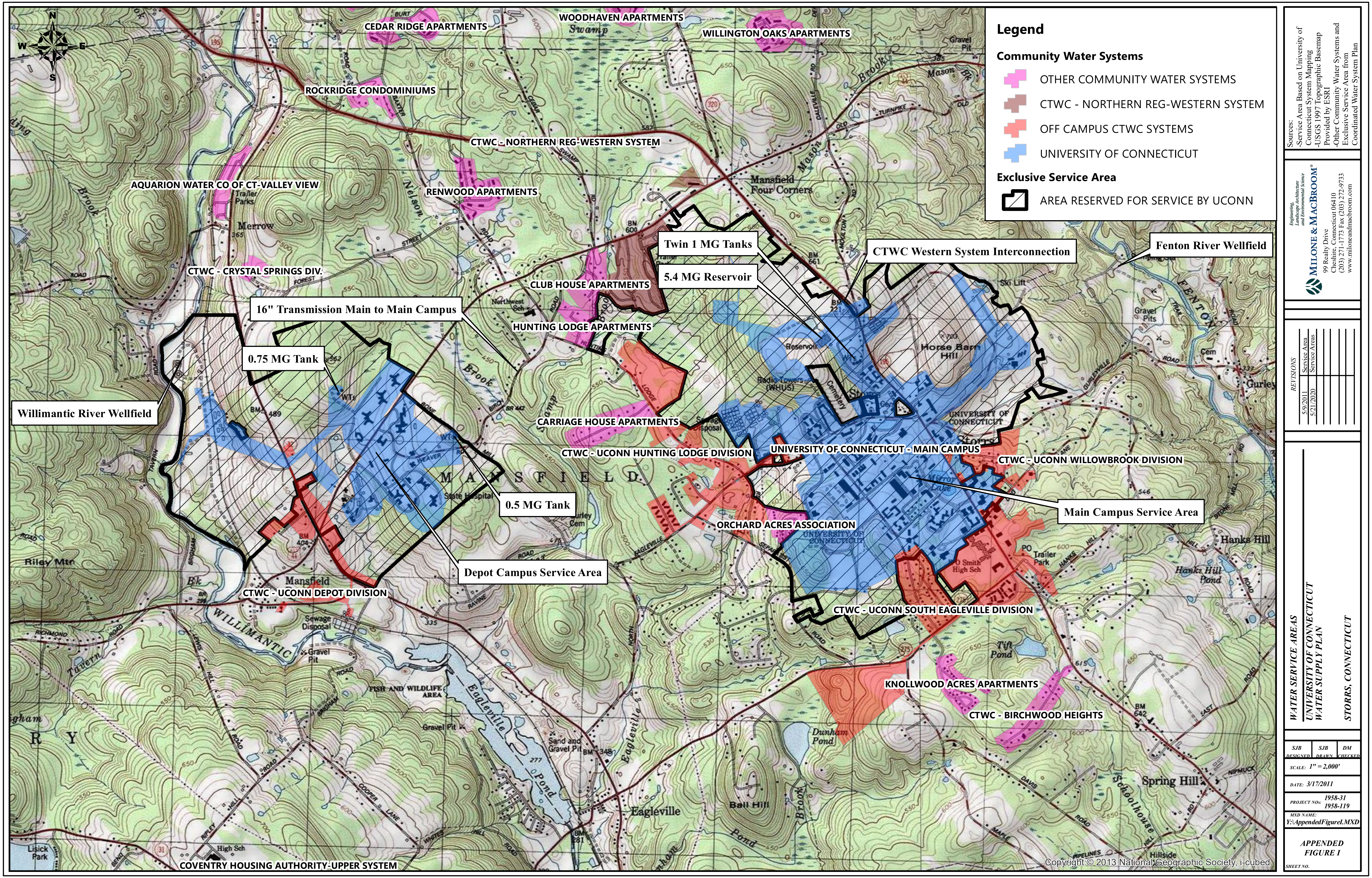
7.4 Financing of Proposed Improvements and Programs

Three types of financing are planned for the above improvements. Operating budget expenses such as metering, meter testing, main breaks, and routine repairs are paid from the annual budget of the Facilities Department. Capital improvement funds are necessary for significant projects which otherwise could not be constructed using funds from annual budgets and the few remaining water ratepayers.

Public/private partnership is an example of the third category of funding. Outside sources may be necessary for some of the projects listed in the improvement tables, such as providing redundant supply to the Depot Campus and extension of the campus grey water system to new buildings. Without these outside sources, some of the proposed projects may be difficult to fund using annual budgets and State funds.

APPENDED FIGURES

Appended Figure 1 – Water Service Areas
Appended Figure 2 – Town of Mansfield Zoning Map


Legend
Community Water Systems
OTHER COMMUNITY WATER SYSTEMS
CTWC - NORTHERN REG-WESTERN SYSTEM
OFF CAMPUS CTWC SYSTEMS
UNIVERSITY OF CONNECTICUT
Exclusive Service Area
AREA RESERVED FOR SERVICE BY UCONN
CEDAR RIDGE APARTMENTS
WOODHAVEN APARTMENTS
WILLINGTON OAKS APARTMENTS
ROCKRIDGE CONDOMINIUMS
CTWC - NORTHERN REG-WESTERN SYSTEM
AQUARION WATER CO OF CT-VALLEY VIEW
RENWOOD APARTMENTS
CTWC - CRYSTAL SPRINGS DIV.
Twin 1 MG Tanks
CTWC Western System Interconnection
Fenton River Wellfield
5.4 MG Reservoir
CLUB HOUSE APARTMENTS
16" Transmission Main to Main Campus
HUNTING LODGE APARTMENTS
0.75 MG Tank
Willimantic River Wellfield
CARRIAGE HOUSE APARTMENTS
CTWC - UCONN HUNTING LODGE DIVISION
UNIVERSITY OF CONNECTICUT - MAIN CAMPUS
CTWC - UCONN WILLOWBROOK DIVISION
0.5 MG Tank
Main Campus Service Area
ORCHARD ACRES ASSOCIATION
Depot Campus Service Area
CTWC - UCONN DEPOT DIVISION
CTWC - UCONN SOUTH EAGLEVILLE DIVISION
KNOLLWOOD ACRES APARTMENTS
CTWC - BIRCHWOOD HEIGHTS
COVENTRY HOUSING AUTHORITY-UPPER SYSTEM
MANSFIELD
Mansfield Four Corners
Horse Barn Hill
Storrs
Eagleville
Spring Hill
Hanks Hill
Ball Hill
Riley Mtn
Dunham Pond
Eagleville Pond
Copyright © 2013 National Geographic Society, i-cubed
Sources:
-Service Area Based on University of Connecticut System Mapping
-USGS 1997 Topographic Basemap Provided by ESRI
-Other Community Water Systems and Exclusive Service Area from Coordinated Water System Plan
MILONE & MACBROOM®
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Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com
REVISIONS
5/9/2011 Service Area
5/21/2020 Service Areas
WATER SERVICE AREAS
UNIVERSITY OF CONNECTICUT
WATER SUPPLY PLAN
STORRS, CONNECTICUT
SJB DESIGNED
SJB DRAWN
DM CHECKED
SCALE: 1" = 2,000'
DATE: 3/17/2011
PROJECT NOs: 1958-31 1958-119
MXD NAME: Y:\AppendedFigureI.MXD
APPENDED FIGURE I

Zoning Map

of the
Town of Mansfield, Connecticut
(Effective February 1, 2019)

Map Sources
* Aquifer Protection Areas Adopted January 2, 2019 Adopted by CTDEEP
* The July 1980 FEMA Flood Insurance Study shall take prescedent over flood hazard zone boundaries depicted on this map.

Document Path: N:\GIS CURRENT\Projects\Planning\Planning MXD\Zoning.mxd

APPENDIX A

Operator Certificates

PL-02 Rev 06/13

711096

STATE OF CONNECTICUT
DEPARTMENT OF CONSUMER PROTECTION

450 Columbus Boulevard ✦ Hartford Connecticut 06103

Attached is your license. Such license shall be shown to any properly interested person on request. No such license shall be transferred to or used by any other person than to whom the license was issued.

Plumbing & Piping Contractor license holders must obtain continuing education hours of instruction to renew their licenses in any even-numbered year. Plumbing & Piping Journeyperson license holders must obtain continuing education hours of instruction to renew their licenses in any odd-numbered year. This requirement is mandatory in order for you to properly maintain your license. Visit our website for information at www.ct.gov/dcp. Questions can be directed to the Occupational & Professional Licensing Division at (860) 713-6135 or email dcp.occupationalprofessional@ct.gov.

In an effort to be more efficient and Go Green, the department asks that you keep your email information with our office current to receive correspondence. You can access your account at www.elicense.ct.gov to verify, add or change your email address.

BRANT D BUHLER
[redacted]

STATE OF CONNECTICUT
DEPARTMENT OF CONSUMER PROTECTION

PLUMBING & PIPING LIMITED JOURNEYPERSON
BRANT D BUHLER
[redacted]

License #	Effective	Expiration
PLM.0276623-P6	11/01/2019	10/31/2020

SIGNED

STATE OF CONNECTICUT ✦ DEPARTMENT OF CONSUMER PROTECTION

Be it known that

BRANT D BUHLER
[redacted]

has been certified by the Department of Consumer Protection as a licensed

PLUMBING & PIPING LIMITED JOURNEYPERSON

License # PLM.0276623-P6

Effective: 11/01/2019
Expiration: 10/31/2020

Michelle Seagull
Michelle Seagull, Commissioner

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Be it known that

BRANT D BUHLER

Having given evidence satisfactory to the Department of Public Health of having met the qualifications required by the General Statutes of Connecticut is issued this certificate as

Backflow Prevention Device Tester

No. DWBT.204650

In witness whereof the Connecticut Department of Public Health has issued this certificate effective 10/01/2019 with an expiration of **09/30/2022**

Renée D. Coleman-Mitchell, MPH
Commissioner

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Be it known that

BRANT D BUHLER

Having given evidence satisfactory to the Department of Public Health of having met the qualifications required by the General Statutes of Connecticut is issued this certificate as

Cross Connection Survey Inspector

No. DWCI.250092

In witness whereof the Connecticut Department of Public Health has issued this certificate effective **10/01/2019** *with an expiration of* **09/30/2022**

Renée D. Coleman-Mitchell, MPH
Commissioner

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Be it known that

BRANT D BUHLER

Having given evidence satisfactory to the Department of Public Health of having met the qualifications required by the General Statutes of Connecticut is issued this certificate as

Water Treatment Plant Operator - Class II

No. DWPO.196009-C2

In witness whereof the Connecticut Department of Public Health has issued this certificate effective **01/01/2020**
with an expiration of **12/31/2022**

Renée D. Coleman-Mitchell, MPH
Commissioner

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Be it known that

BRANT D BUHLER

Having given evidence satisfactory to the Department of Public Health of having met the qualifications required by the General Statutes of Connecticut is issued this certificate as

Distribution System Operator - Class III

No. DWDO.201083-C3

In witness whereof the Connecticut Department of Public Health has issued this certificate effective **07/01/2019** *with an expiration of* **06/30/2022**

Renée D. Coleman-Mitchell, MPH
Commissioner

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Be it known that

THOMAS KEARNEY

Having given evidence satisfactory to the Department of Public Health of having met the qualifications required by the General Statutes of Connecticut is issued this certificate as

Backflow Prevention Device Tester

No. DWBT.204406

In witness whereof the Connecticut Department of Public Health has issued this certificate effective 10/01/2017 with an expiration of 09/30/2020

Raul Pino, MD, MPH
Commissioner

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Be it known that

THOMAS KEARNEY

Having given evidence satisfactory to the Department of Public Health of having met the qualifications required by the General Statutes of Connecticut is issued this certificate as

Cross Connection Survey Inspector

No. DWCI.250064

In witness whereof the Connecticut Department of Public Health has issued this certificate effective **10/01/2017** *with an expiration of* **09/30/2020**

Raul Pino

Raul Pino, MD, MPH
Commissioner

STATE DEPARTMENT OF PUBLIC HEALTH CONNECTICUT

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

Be it known that

THOMAS KEARNEY

Having given evidence satisfactory to the Department of Public Health of having met the qualifications required by the General Statutes of Connecticut is issued this certificate as

Distribution System Operator - Class I

No. DWDO.194019-C1

In witness whereof the Connecticut Department of Public Health has issued this certificate effective **01/01/2018** *with an expiration of* **12/31/2020**

Raul Pino, MD, MPH
Commissioner

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Be it known that

THOMAS KEARNEY

Having given evidence satisfactory to the Department of Public Health of having met the qualifications required by the General Statutes of Connecticut is issued this certificate as

Water Treatment Plant Operator - Class II

No. DWPO.204186-C2

In witness whereof the Connecticut Department of Public Health has issued this certificate effective **04/01/2020** *with an expiration of* **03/31/2023**

Renée D. Coleman-Mitchell

Renée D. Coleman-Mitchell, MPH
Commissioner

APPENDIX B

Contractual Agreements (UConn-CWC Agreement is Exhibit H)

WATER SUPPLY DEFINITIVE AGREEMENT

THIS AGREEMENT, is made and entered into as of the 21st day of January 2014, by and between the TOWN OF MANSFIELD, CONNECTICUT, a municipal corporation organized and existing under the laws of the State of Connecticut ("Town"), and CONNECTICUT WATER COMPANY, a Connecticut corporation having its principal offices at Clinton, Connecticut (together with its successors and assigns, "CWC").

RECITALS

WHEREAS, the University of Connecticut, a non-profit state institution of higher education, organized under the laws of the State of Connecticut ("State"), with principal administrative offices at Storrs, Connecticut (together with its successors and assigns, "UConn"), operates and maintains a system of water distribution infrastructure located in Storrs, Connecticut, that provides potable water to the Town pursuant to that certain Sewer and Water Service Agreement dated as of January 27, 1989 by and between the Town and UConn; and

WHEREAS, the Town owns and operates certain other water distribution infrastructure that provides potable water to certain municipal and other users; and

WHEREAS, pursuant to the Connecticut Environmental Policy Act, C.G.S. §§ 22a-1 *et seq*., and regulations promulgated thereunder (collectively "CEPA"), UConn completed an environmental impact evaluation and record of decision for potential sources of water supply; and

WHEREAS, consistent with the provisions of Section 92 of Public Act 11-57, UConn consulted with the Town throughout the development of the referenced environmental impact evaluation and record of decision, and the record of decision endorsed CWC as the proposed water utility supplier as detailed therein; and

WHEREAS, the Connecticut Office of Policy and Management has reviewed the referenced environmental impact evaluation, record of decision and related documentation, and determined that UConn satisfied the requirements of CEPA and rendered its approval of the record of decision; and

WHEREAS, UConn has expressed a desire to transfer the responsibility for serving off-campus customer to CWC; and

WHEREAS, the Town desires to receive water supply and utility service from CWC, thereby also securing a supplemental supply of potable water for proposed locally-approved future needs, including but not limited to the Four Corners area; and

WHEREAS, CWC, a public service company subject to the jurisdiction of the Public Utilities Regulatory Authority with public water supply infrastructure extending into Tolland, Connecticut, desires to provide water supply service to the Town as set forth in this Agreement; and

WHEREAS, CWC upon the receipt of required approvals from Governmental Authorities and construction of the proposed infrastructure, shall be ready, willing and able to provide the Town with the water supply service specified in this Agreement; and

WHEREAS, the Town and CWC negotiated a non-binding letter of intent to serve as the basis of this Agreement, which was approved on October 28, 2013 by the Town Council and executed October 29, 2013 in conformance with the laws of the State and the Mansfield Town Charter.

NOW, THEREFORE, for and in consideration of the foregoing and of the mutual covenants, promises, obligations and undertakings contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Town and CWC (hereinafter, collectively "Parties" and individually a "Party") hereby agree as follows:

SECTION 1. DEFINITIONS AND ADOPTION

1.1 Definitions. As used in this Agreement, the following terms have the respective meanings set forth below:

"Billed Customers" shall mean those persons, associations, partnerships or corporations of record having a legal obligation to pay for Potable Water supply service as the owners of real property receiving water or tenants thereof having an obligation to pay for water pursuant to an agreement with the real property owner.

"Campus Connection Spur" shall mean the pipeline, valves and related appurtenances to interconnect from the CWC pipeline at Point of Delivery to other elements of the UConn System.

"Capital Improvements" shall mean the water supply pipeline, pumping stations, pumping station upgrades, pressure reducing valves and related appurtenances and work performed by CWC to interconnect the CWC system at Anthony Road and Merrill Road in Tolland to the UConn System, and the infrastructure on Middle Turnpike that would serve the Four Corners in Mansfield, as identified in Exhibit A attached hereto and hereby incorporated into this Agreement.

"Completion Date" shall mean the date of the Town's receipt of CWC's written notice of completion of construction and testing of Capital Improvements provided UConn has completed construction of the Campus Connection Spur to interconnect to the CWC system.

"Connecticut General Statutes" or "C.G.S." shall mean the State of Connecticut General Statutes, Revision of 1958, revised to 2013, and as revised and amended from time to time.

"CTDEEP" shall mean the Connecticut Department of Energy and Environmental Protection, or its successor as established by Law.

"CTDPH" shall mean the Connecticut Department of Public Health, or its successor as established by Law.

"CWC" shall mean the Connecticut Water Company, its successors and assigns.

"CWC Emergency Contingency Plan" shall mean the Emergency Contingency Plan of the Connecticut Water Company as approved by PURA and revisions and amendments thereto> A copy of the Stages of the Emergency Contingency Plan - Western System, which would be applicable in Mansfield, appears in Exhibit B attached hereto and is hereby incorporated into this Agreement.

"CWC Main Extension Agreement" shall mean the Main Extension Agreement used by the Connecticut Water Company for main extensions referenced in Section 2.2 hereof, such agreement to be in conformance with the then-current PURA regulations and decisions; an example of the current form of the main extension agreement appears in Exhibit C attached hereto and is hereby incorporated into this Agreement.

"CWC Regulations" shall mean the Rules and Regulations of the Connecticut Water Company as approved by PURA on July 14, 2010, and revisions and amendments thereto as approved by PURA, a copy which appears in Exhibit D attached hereto and is hereby incorporated into this Agreement.

"CWC System" shall include the Capital Improvements and the Existing Infrastructure that is used to provide water service to customers in the Town of Mansfield

"CWC Water Supply Plan" shall mean the Water and Supply Plan of the Connecticut Water Company required pursuant to C.G.S. Section 25-32d and revisions and amendments thereto. A then-current copy of the plan for the Western System shall be provided to the Town Clerk, less any provisions redacted for security reasons established by Law, and shall be available for inspection in Town Hall.

"Customer" shall mean any Existing Customer and New Customer as defined herein.

"Diversion Permit" shall mean an authorization issued by the CTDEEP pursuant to the Water Diversion Policy Act, C.G.S. §§22a-365 *et seq.*, as amended, in such form as required by CTDEEP for the purpose of authorizing CWC to provide water to the Town as required by this Agreement.

"Exclusive Service Area" shall mean an area where public water is supplied by one system as established by the CTDPH pursuant to C.G.S. §§25-33c *et seq.*, as amended.

"Existing Customers" shall mean all Billed Customers receiving water supplied by UConn on Existing Infrastructure as of the Completion Date, including any Town Facilities and fire hydrants.

"Existing Infrastructure" shall mean the Town Infrastructure and UConn Off Campus Infrastructure as defined herein.

"Fire Protection Charges" shall mean the PURA approved charges authorized to recover the costs of infrastructure such as increased sizes of water mains, increased pump capacity, and increased storage capacity necessary for the utility to supply the volume and pressure of water for fighting fires while, at the same time, supplying daily water needs.

"Freedom of Information Act" or "FOIA" shall mean the Freedom of Information Act as set forth in C.G.S. §§1-200 *et seq.* and amendments thereto.

"Fully Depreciated" shall mean the time at which pipes owned by the Town and the University at the time of the agreement have reached the age of 60 years at which time the asset is deemed to have a salvage value of zero and would be transferred to CWC ownership.

"Governmental Approval" means any authorization, consent, approval, license, franchise, lease, ruling, permit, tariff, rate, certification, exemption, filing or registration by or with any Governmental Authority having jurisdiction on matters covered by this Agreement (including, but not limited to, zoning variances, special exceptions and non-conforming uses).

"Governmental Authority" means any federal, state, departmental or municipal government or any political subdivision thereof, and any other entity exercising executive, legislative, judicial, regulatory or administrative functions of or pertaining to government, and any other governmental entity but excluding in all cases UConn.

"Law" or "Laws" shall mean federal, state, local, foreign or other laws, regulations, orders, injunctions, building and other codes, ordinances, permits, licenses, judgments, decrees of federal, state, local, foreign or other authorities, and all orders, writs, decrees and consents of any Governmental Authority, or any court or similar Person established by any such governmental or political subdivision or agency thereof but excluding in all cases UConn. An illustrative, but not exclusive, summary of principal Laws applicable to this Agreement is attached as Exhibit E attached hereto and hereby incorporated into this Agreement.

"Licenses and Permits" shall mean any license, permit, registration, certificate, order, approval, franchise, variance and similar right issued by or obtained from any Governmental Authority or any third party that is required in connection with the operation of a Party's water supply system, the Capital Improvements or the Supply System Improvements.

"Meter" shall mean a water volume measuring device, meeting design, type and specification per industry standards and PURA regulations, that is used for the purpose of measuring water volumes as provided in this Agreement.

"New Customer Rate" shall mean the rate charged by CWC to New Customers which shall be equal to the water commodity charge and basic service charge as approved by PURA for similarly defined categories of CWC customers.

"New Customers" shall mean all Billed Customers after the Completion Date who shall be direct customers of CWC that are not Existing Customers, and shall be charged by CWC at the New Customers Rate.

"Notice of Completion" shall mean a written notice from CWC confirming the completion of all necessary or appropriate construction and testing of Capital Improvements in conformance with the requirements of the Agreement.

"Person" shall mean any natural person, estate, partnership, corporation, trust, unincorporated association, limited liability company, joint venture, organization, business, individual, municipality, government or any agency or political subdivision thereof, tribal nation, tribe or any other entity.

"Potable Water" shall mean water of a quality meeting or exceeding those standards for quality of drinking water established by the CTDPH pursuant to C.G.S. § 19a-36, including R.C.S.A. § 19-13-B102, and as such standards may be revised or amended from time to time.

"Public Authority Rate" shall mean the PURA-approved rates and charges as specified in CWC's rate schedule to be paid for water provided at a public facility in the Town of Mansfield or a successor charge established by PURA to replace the Public Authority rate in effect at the time of the agreement.

"Public Facility" shall mean any real or personal property owned, leased, operated, maintained, or occupied by the Town, including, but not limited to, the Mansfield Housing Authority, Regional School District #19, and the Mansfield Public Schools, including fixtures and appurtenances thereto.

"PURA" shall mean the Public Utilities Regulatory Authority presently within the CTDEEP, or its successor as established by Law.

"R.C.S.A." shall mean the Regulations of Connecticut State Agencies, and as revised and amended from time to time.

"Reasonable Efforts" shall mean the taking of any and all actions which are commercially reasonable under the circumstances and reasonably required to accomplish the desired task or achieve the desired result.

"Record of Decision" or "ROD" shall mean the Final Record of Decision and Environmental Impact Evaluation (EIE) for Potential Sources of Water Supply, University of Connecticut, Storrs, CT, University Project #901662, dated July 30, 2013.

"Storrs Customer Rate" shall mean the rate for water service to be charged by CWC for Existing Customers at the Completion Date which shall be equal to the rates and charges applied by UConn at that time. The rates and charges of UConn as of the Effective Date of this Agreement are as set forth in Exhibit F.

"System" shall collectively mean the CWC system, and any capacity upgrades made by CWC to meet the demands pursuant to the CWC Water Supply Plan.

"System Improvements" shall mean equipment, modifications and all work or actions to be taken by CWC in connection with the CWC System to meet all CWC obligations under this Agreement.

"Town" shall mean the Town of Mansfield, Connecticut.

"Town Infrastructure" shall mean the Town owned water distribution infrastructure as more fully described in Exhibit G attached hereto and hereby incorporated into this Agreement.

"UConn" shall mean the University of Connecticut, its successors and assigns.

"UConn/CWC Agreement" shall mean that certain Water Supply and Development Agreement by and between UConn and CWC and dated as of December 18, 2013, a copy of which appears in Exhibit H attached hereto.

"UConn Infrastructure" shall mean the UConn water distribution infrastructure on campus as more fully described in Exhibit I attached hereto and hereby incorporated into this Agreement.

"UConn Off Campus Infrastructure" shall include the UConn off campus water distribution system, that provides the water supply for the customers in Mansfield as depicted on Exhibit J that is attached hereto and hereby incorporated into this Agreement.

"Water System Advisory Committee' or "Advisory Committee" shall mean the group of representatives that will provide local input to CWC and ensure communication and collaboration relating to the water system as described in Section 9.4 of this Agreement.

1.2 Adoption of Preamble and Recitals. The Parties each adopt and certify that each of those respective statements concerning such Party as stated in the preamble and recital of this Agreement are true and correct, and are hereby incorporated into the body of this Agreement as though fully set forth in their entirety herein, provided that in cases of conflict, the provisions stated in the body of the Agreement shall control over statements in the preamble and recital.

SECTION 2. WATER SUPPLY

2.1 Water Supply Service

(a) Subject to the terms and conditions of this Agreement, beginning on the Completion Date, CWC shall have and agrees to sell and supply to Customers in Mansfield on a 24 hour per day and 365 day per year basis all Potable Water required to meet their demands. CWC shall fulfill its obligation set forth in this Section in strict conformance with the Law.

(b) CWC shall be authorized and obligated to provide water service for current and future customers on the CWC System in the Town of Mansfield in accordance with all applicable Laws. CWC shall be responsible to meet the current and future public water supply needs for customers in Mansfield, meeting the PURA standards for service at PURA approved rates and all DPH requirements or other applicable laws regarding the purity and adequacy of the water supply.

(c) CWC shall provide Potable Water at the pressure necessary to ensure proper service to Customers in accordance with the Law.

(d) CWC shall supply and deliver Potable Water to Customers using the System in strict conformity with the Law. CWC shall be responsible for ensuring that all water delivered pursuant to this Agreement meets the quality standards for Potable Water set forth in the Law.

(e) In the event that there is a water quality violation in the CWC System in the Town of Mansfield, CWC shall provide notice to customers as required by Law and shall advise the local health official and Town Manager in Mansfield of such violation.

2.2 New Service Connections

(a) CWC shall not permit customer connections to the System by any Person that would violate any connection restriction set forth in the ROD except as ordered or directed by PURA pursuant to C.G.S. §16-20 and with timely notice of initiation of such PURA proceeding being given by CWC to the Connecticut Office of Policy and Management, UConn and the Town.

(b) CWC shall notify any Person, upon request, of the availability of water supply but shall not permit any connection to the CWC System unless the New Customer to be served by such connection first obtains any required Governmental Approvals.

(c) CWC shall notify the Town Director of Planning and Development of any Person seeking to connect to the System and shall allow the connections as authorized by this Agreement.

(i) Connection to the CWC System in Mansfield for properties that do not require a main extension shall be permitted, where such uses are consistent with zoning regulations in effect at the time of the request, after providing notice to the Director of Planning and Development, and the applicant has demonstrated that any required local approvals for building or public health or as otherwise required are secured.

(ii) Connection to the CWC System in Mansfield for properties that do not require a main extension shall be permitted to allow for the existing use of properties, after providing notice to the Director of Planning and Development.

(iii) Connections to the CWC System in Mansfield, whether a new use or change to existing use that require a change in zoning or approval by a local land use commission shall be permitted after (a) providing notice to the Director of Planning and Development, (b) allowing for review by the Advisory Committee, and (c) demonstration by the applicant to CWC that all required approvals are secured.

(iv) Any extension of the CWC System in Mansfield after the Completion Date shall be undertaken in consultation with the Advisory Committee established pursuant to Section 9.4 hereof and permitted if the applicant has demonstrated to CWC that all required approvals have been secured and such extension complies with the CWC Main Extension Agreement as applicable.

SECTION 3. WATER RATES, CHARGES AND CUSTOMERS

3.1 Customer Water Rates

(a) Customers served by UConn after the Effective Date of this Agreement shall continue to be served by and billed by UConn until the Completion Date.

(b) As of the Completion Date all Existing Customers, including any Town Facilities and fire hydrants, shall become direct customers of CWC and shall be charged the Storrs Customer Rate by CWC. After the Completion Date, the Storrs Customer Rate shall be subject to adjustment by the same dollar amount change approved by PURA for similarly defined categories of CWC customers.

(c) After the Completion Date, all Billed Customers that are not Existing Customers shall be direct customers of CWC ("New Customers") and shall be charged by CWC at a rate equal to the rates and charges as approved by PURA for similarly defined categories of CWC customers as may be amended from time to time subject to PURA approval.

(d) Notwithstanding Section 3.1(b), any Public Facility that qualifies as a New Customer shall be charged by CWC at a rate equal to the Public Authority rates and charges as approved by PURA for similarly defined categories of customers. The Town shall be charged the PURA approved CWC Fire Protection Charges for any fire hydrants in service after the Completion Date.

(e) Customers in Mansfield, including any Public Facility, shall be subject to applicable PURA approved surcharges or surcredits at the same percentage basis as other CWC customers.

(f) Customers shall pay PURA-approved rates and charges, including any applicable surcharges for the Potable Water received by the Customer. Customers, including the Town, shall not be subject to any form of "take or pay" charges.

(g) The Parties shall use all reasonable efforts to advocate to PURA for its approval of the rates set forth in this Section 3. In the event that the rates set forth in this Agreement are not approved by PURA as proposed, CWC shall notify the Town and advise them of the process for approval of alternate rates and opportunities to provide comment on the record to PURA on the revised request.

3.2 Water Supply Planning and Information Sharing

(a) The Parties agree to cooperate in the timely exchange of reasonably available information including projected water supply and demand data, and related operations information to facilitate required water supply planning efforts, and to minimize over-estimation or under-estimation of infrastructure capacity needs by either Party.

(b) The Parties agree to reasonably cooperate to provide information to facilitate the periodic revision of applicable water supply plans, to give timely notice and information concerning anticipated capital projects likely to affect water supply or demand volumes, and to timely provide other information regarding identified changes to the water supply or demand characteristics that may affect the operations that are the subject of this Agreement.

SECTION 4. REPRESENTATIONS, WARRANTIES AND COVENANTS

4.1 Representations, Warranties and Covenants of CWC. CWC represents and warrants as follows:

(a) Authorization; No Restrictions; Consents or Approvals. CWC has full power and authority to enter into and perform this Agreement, and all action necessary to authorize the execution and delivery of this Agreement and the performance by CWC of its obligations hereunder has been taken. This Agreement has been duly executed by CWC and constitutes the legal, valid, binding and enforceable obligation of CWC, enforceable against CWC in accordance with its terms subject to bankruptcy laws affecting creditors' rights generally. The execution and delivery of this Agreement and the consummation by CWC of the transactions contemplated herein or hereby, do not (i) conflict with or violate any of the terms of CWC's charter or by-laws or other constituent documents or governing instruments, or, to CWC's knowledge, any applicable Laws, (ii) conflict with, or result in a breach of any of the terms of, or result in the acceleration of any indebtedness or obligations under, any agreement, obligation or instrument by which CWC is bound or to which any property of CWC is subject, or constitute a default thereunder or (iii) conflict with, or result in or constitute a default under or breach or violation of or grounds for termination of any Licenses and Permits or other Governmental Approval to which CWC is a party or by which CWC may be bound, or result in the violation by CWC of any Laws to which CWC or any assets of CWC may be subject, except for any such conflict, violation, breach, default or acceleration which would not have a material adverse effect on the ability of CWC to fulfill its obligations under this Agreement or materially and adversely affect the consummation of the transactions contemplated herein.

(b) Technical Knowledge. CWC has at the time of execution of this Agreement, or will have secured in a manner necessary to timely perform under this Agreement, adequate capacity, technical knowledge and employees to fulfill its obligations under this Agreement.

(c) Title to Assets. CWC has at the time of execution of this Agreement, or will have secured in a manner necessary to timely perform under this Agreement, sufficient right, title and interest in and to its assets to be able to carry out its obligations under this Agreement. CWC has not granted any liens, security interests and other encumbrances against its assets, and such assets have or will have as of the Completion Date and during the Term sufficient capacity for CWC to fulfill its obligations under this Agreement.

(d) Licenses and Permits. The execution, delivery and performance of this Agreement and the consummation of the transactions contemplated hereby and thereby will not result in the revocation, cancellation, suspension, modification, or limitation of any of CWC's Licenses and Permits and will not give to any Person any right to revoke, cancel, suspend, modify, or limit any of CWC's Licenses and Permits. Renewal of each of CWC's Licenses and Permits has been or shall be timely applied for to the extent required under all Laws, and to the extent appropriate to protect renewal rights thereunder. To the CWC's knowledge, there is no fact or event which is likely to prevent the renewal of any of CWC's Licenses and Permits under existing Laws or which, with the passage of time or the giving of notice or both, is likely to constitute a violation of the terms of any of CWC's Licenses and Permits or of any applications or agreements made in connection therewith. No action or proceeding is pending or, to the CWC's knowledge threatened, which could result in the revocation, cancellation, suspension, modification, or limitation of any of CWC's Licenses and Permits.

(e) Compliance with Law. CWC is presently in compliance with all applicable Laws with respect to matters relevant to the subject of this Agreement, and to CWC's knowledge no event has occurred which would constitute reasonable grounds for a claim that non-compliance has occurred or is occurring.

(f) Real Estate Interests. CWC has at the time of execution of this Agreement, or will have secured in a manner necessary to timely perform under this Agreement, and will maintain, protect and defend sufficient right, title and interest in all real estate, easements, rights of way and any other interests in real estate to enable CWC to fulfill its obligations, covenants and agreements pursuant to this Agreement.

(g) Pending Litigation. There are no actions, suits, claims, enforcement actions, or proceedings pending against CWC or any Person by reason of CWC being an official or officer of CWC, whether at law or in equity or before or by any federal, state, municipal or other governmental department, commission, board, bureau, agency or instrumentality which, if adversely determined, would have a material adverse effect on the business, financial position, or results of operations of CWC; nor is there outstanding any writ, order, decree, or injunction applicable to CWC that (i) calls into question CWC's authority or right to enter into this Agreement and consummate the transactions contemplated hereby, or (ii) would otherwise prevent or delay the transactions contemplated by this Agreement.

4.2 Covenants of CWC. CWC covenants not to impose upon the Town or any Customer in Mansfield any special charge, fee or assessment, including, but not limited to, so-called "wheeling charges," resulting from CWC's use of UConn Infrastructure to serve customers in Mansfield.

SECTION 5. CAPITAL IMPROVEMENTS AND SYSTEM DEVELOPMENT

5.1 Design and Construction by CWC. Except as otherwise specifically provided in this Agreement, all matters relating to the design, engineering, permitting, construction, start-up, inspection and testing of the System Improvements, including but not limited to the hiring of contractors and engineers, shall be the sole responsibility, cost and expense of CWC.

5.2 Design Standards. CWC agrees that all Capital Improvements shall be designed, constructed and tested in compliance with (i) prudent industry practices, (ii) the environmental mitigation measures and best construction management practices outlined in the ROD, (iii) all applicable requirements of Governmental Authorities and Laws, including CTDPH "Guidelines for the Design and Operation of Public Water System Treatment, Works and Sources", and (iv) in accordance with the UConn/CWC Agreement.

5.3 Right of Review and Approval. The Town, its employees, agents, representatives and contractors (which may be selected in the Town's sole discretion) shall have the right, but no obligation, to review and approve those aspects of the design, engineering, materials and construction plans and specifications proposed by CWC for the Capital Improvements that relate to design, standards and conditions outlined in the ROD, provided that any such Town review and approval shall not be unreasonably delayed or withheld, and provided further that the Town will timely advise CWC if the Town intends not to undertake such review and/or such approval process.

5.4 Infrastructure Development Costs. CWC shall be solely responsible for all fees, capital costs and expenses related to the performance of the Capital Improvements obligations under the terms of this Agreement except the UCONN Campus Spur without imposing an assessment on the Town or any Customer in Mansfield for the construction of that infrastructure. The Town shall be solely responsible for its own legal and professional costs and expenses related to its opportunity for review of System Improvements under this Section 5.

5.5 Easements and Rights of Way. CWC shall be solely responsible, at its cost and expense, for obtaining and maintaining all easements, rights-of-way or other access and entry authorizations required for CWC to perform its System Improvement obligations under this Agreement. The Town shall grant CWC such easements at no cost as are reasonably necessary for CWC to perform its obligations under this Agreement at locations accessed through land owned by the Town.

5.6 Construction Activities Review and Meetings. The Town shall have the right but no obligation to observe and inspect all construction, start-up, inspection and testing activities related to the System Improvements at any reasonable time to confirm CWC's compliance with this Agreement. The Parties agree to establish a mutually acceptable schedule no less frequently than monthly for CWC to present progress reports to the Town. CWC shall reasonably address any good faith comments or concerns presented orally by the Town in the course of Town observation periods, inspections, progress report meetings, or in writing from the Town to CWC at any time.

5.7. Coordination with Sewer Construction. The Parties agree to use Reasonable Efforts to coordinate the planning and timing of new water main construction with sewer installation or other Town road work planned for the same area.

SECTION 6. WATER SUPPLY INFRASTRUCTURE OWNERSHIP AND MANAGEMENT

6.1 System Ownership. The Parties agree that title to any Existing Infrastructure and off-campus UConn Infrastructure (as contemplated by the UConn/CWC Agreement) shall be transferred to and accepted by CWC upon either its being fully depreciated by the Town or UConn, as applicable, or upon the date of its replacement by CWC, whichever first occurs. Moreover, the Parties agree that CWC takes immediate title to Capital Improvements.

6.2 License to CWC.

(a) The Town shall provide to CWC on the Completion Date, and prior to the transfer of ownership pursuant to Section 6.1 hereof, an irrevocable license authorizing CWC to use, maintain, repair and replace Town Infrastructure as required to serve Existing Customers and New Customers.

(b) Prior to the Completion Date, and prior to the transfer of ownership pursuant to Section 6.1 hereof, CWC shall obtain an irrevocable license from UConn authorizing CWC to use, maintain, repair and replace University owned infrastructure as required to serve Existing Customers and New Customers.

6.3 Infrastructure Operation and Maintenance. As of the Completion Date and thereafter, CWC shall have responsibility at its sole cost and expense to operate, maintain, repair and replace the System in accordance with Law.

6.4 Property Taxes. CWC shall be solely liable for real property, personal property or any other tax with respect to any portion of the System owned by CWC.

SECTION 7. INSURANCE, INDEMNIFICATION AND DISPUTE RESOLUTION PROCEDURES

7.1 Insurance. CWC shall carry and maintain during the period of time it is using Town Infrastructure pursuant to the irrevocable license provided by the Town pursuant to subsection 6.2(a), at its sole cost and expense, such insurance as CWC and the Town reasonably agree to be satisfactory to protect both CWC and the Town adequately against any and all loss, damage or liability arising out of or in connection with the transactions contemplated by this Agreement and the operation and maintenance of the System. Such insurance policies shall contain such terms, shall be in such form, shall be with such insurers, and shall be for such periods as may be reasonably satisfactory to CWC and the Town, including the following specific provisions: i) Comprehensive General Liability including Premises and Operations, Contractual Liability, Products and Completed Operations on an occurrence basis with a combined limit of at least $1,000,000, and, ii) Umbrella Liability with a limit of $5,000,000 over primary limits for Employer Liability, General Liability and Automobile Liability. A certificate of insurance reflecting the coverage required herein and naming the Town as an additional insured shall be provided to the Town to confirm the coverage, maintenance and extension of insurance required by this Agreement including a thirty (30) day prior notice of cancellation provision.

7.2 Indemnification. CWC shall indemnify, defend and hold the Town, its trustees, officers, employees and agents harmless from and against all liabilities, damages, losses, penalties, claims, demands, suits and proceedings of any nature whatsoever for personal injury (including death) or property damage of third parties that may arise out of or are in any manner connected with the performance of this Agreement by CWC. CWC's indemnity obligations hereunder shall not be limited by any coverage exclusions or other provisions in any insurance policy maintained by CWC which is intended to respond to such events. This indemnification obligation shall include, but is not limited to, all claims against the Town by an employee or former employee of the CWC or any subcontractor and CWC expressly waives all immunity and limitation on liability under any Industrial Insurance Act, other workers' compensation act, disability benefit act, or other employee benefit act of any jurisdiction which would otherwise be applicable in the case of such a claim. The provisions of this Section 7.2 shall survive termination of this Agreement.

7.3 Informal Resolution of Disputes. The Parties agree that if a dispute arises between the Parties relating to the rights, duties, or obligations arising out of this Agreement, then the Parties shall first meet informally in a good faith effort to negotiate a resolution of the dispute. If the Parties do not resolve a dispute in the informal process described herein, then either Party may propose, and the other Party shall agree, to undertake good faith efforts to settle the dispute by the then current non-administered Mediation Rules of the American Arbitration Association. Nothing in this provision of the Agreement shall affect the participation or intervention rights of the Town under Section 9 of this Agreement.

SECTION 8. WATER SUPPLY PERMITTING AND LICENSING

8.1 Regulatory Permits and Approvals.

(a) CWC shall be solely responsible, at its sole cost, for securing all Licenses and Permits or other Governmental Approvals, including modifications or renewals thereof, necessary or appropriate to construct or operate infrastructure or equipment to supply and deliver Potable Water or otherwise necessary for CWC to perform its obligations under this Agreement including PURA approval of water rates as set forth in this Agreement.

(b) The Parties agree to cooperate and use Reasonable Efforts to secure Licenses and Permits or other Governmental Approvals, including modifications and renewals thereof, as necessary and appropriate and in conformance with applicable Law. Notwithstanding the foregoing, the Town shall have no responsibility or liability regarding such activities of CWC.

(c) CWC shall be solely responsible for legal, engineering, and consulting and expert witness costs, administrative fees and other expenses arising in connection with CWC efforts to secure the Diversion Permit, Permits and Licenses or Governmental Approvals, including modifications or renewals thereof, and all other state agency proceedings and court proceedings related to the matters that are the subject of this Agreement or CWC's efforts to perform its obligations under this Agreement. The Town shall have no responsibilities or cost obligations in connection with such efforts, proceedings or matters.

SECTION 9. METERS, BILLING, RECORDS AND COMMUNITY COORDINATION

9.1 Water Meters.

(a) CWC shall own, install, maintain, repair, replace and operate Meters serving Customers, at its sole cost and expense.

(b) CWC metering procedures shall conform to the CWC Regulations,. Procedures for reading Meters, conducting investigations of Meter accuracy or performance, Meter testing and the resolution of Meter discrepancies shall be those set forth in applicable Law.

9.2 Billing.

(a) CWC billing procedures shall conform to the CWC Regulations, as approved by PURA.

(b) The Customer as defined by CWC Regulations shall mean the Billed Customers as specified by this Agreement.

9.3 Freedom of Information Act Requirements. Although CWC is not subject to the Freedom of Information Act, it will use Reasonable Efforts to assist the Town in complying with its obligations under the Freedom of Information Act, as applicable to information that may be created or maintained under the terms of this Agreement. CWC is not a Public Agency as defined by FOIA, and nothing in this agreement is intended to cause CWC to function as a Public Agency.

9.4 Water System Advisory Committee CWC shall commit to the establishment of a Water System Advisory Committee ("Advisory Committee") to provide local input and ensure communication and collaboration relating to the water system.

(a) The Advisory Committee shall be comprised of representatives of the Town, UConn, local health officials, representatives of adjacent towns including Coventry, Tolland and Windham, and other stakeholders as agreed upon by the Parties to this Agreement.

(b) The Advisory Committee shall advise CWC in connection with the supply of Potable Water and the operation, expansion and integration of the CWC System. The Advisory Committee shall provide information regarding plans and regulations of local land use commissions, consistency of proposals with the Plan of Conservation and Development, and future water supply needs that should be considered in the CWC Water Supply Plan.

(c) The Advisory Committee shall also make recommendations of best management practices, including but not limited to water conservation programs, and CWC shall work cooperatively with the Advisory Committee in the implementation thereof.

(d) The Committee shall serve in an advisory role and shall not approve or deny specific projects or otherwise limit CWC's ability to perform their obligations under the Agreement with the Town or the University or to comply with other statutes or regulations.

(e) The Parties shall establish the Advisory Committee with provisions governing membership and identifying the stakeholders to be represented through a Memorandum of Agreement to be completed and executed within one hundred and twenty (120) days from the execution of this Agreement.

9.5 Best Management Practices. In addition to any recommendations of the Advisory Committee, the Parties agree to the following best management practices:

(a) During non-emergency phases of the CWC Emergency Contingency Plan, such as a water supply advisory, watch or warning, the Town would work cooperatively with CWC to encourage Customers to reduce water use consistent with the CWC Emergency Contingency Plan.

(b) CWC shall support and assist the Town in implementing any zoning, wetland and other similar land use plans to mitigate development pressures in areas identified by the Town and consistent with the ROD, provided that such support and assistance can be harmonized with CWC's obligation under C.G.S. §16-20.

(c) CWC shall support efforts to employ water conservation practices using water flow reducers and aerators, shutoff valves, leak detection systems, water reuse and reclamation and other practices.

(d) In consultation with the Advisory Committee, CWC shall make recommendations in connection with the provision of customer education programs and related financial incentives to encourage water consumption reduction.

9.6 Enforcement of CWC Obligations. CWC shall be responsible to meet with current and future public water supply needs in Mansfield in strict compliance with PURA regulations and at the PURA-approved rates as set forth herein. In the event it fails to meet the foregoing requirements, CWC shall be subject to any applicable enforcement actions by a Governmental Authority and the Town may petition PURA pursuant to C.G.S. §1-10a or §16-20. The Parties Agree that in the event PURA finds that CWC failed to provide water supply service which is adequate to serve the public convenience and necessity, PURA may make such orders as may be within its statutory authority including, if consistent with existing Laws, revocation of CWC's franchise to serve Customers in the Town of Mansfield, or any portion thereof.

9.7 Exclusive Service Area. On or after the convening of a water utility coordinating committee pursuant to C.G.S. §§25-32c *through* 25-32j, CWC would seek and the Town would reasonably support the designation of an Exclusive Service area in the Town to CWC, except for those areas served at that time or more appropriately served by other regulated public water systems. The Town's obligation as set forth in this Section 9.7 is subject to CWC's fulfillment of its obligations pursuant to this Agreement.

9.8 CWC Sale. Any proposed sale or transfer of CWC would be subject to the approval of PURA and any successor thereto shall be obligated to meet or exceed any and all obligations of CWC pursuant to this Agreement. The Town and any Customers shall have the right to participate in any such PURA proceeding, including seeking intervener status, provision of input and may request any specific terms or conditions of such sale or transfer to protect its interests.

SECTION 10. FORCE MAJEURE EVENT AND SPECIAL NOTICE

10.1 Force Majeure Event. If any Party is prevented from performing any of its obligations hereunder, for reasons beyond its reasonable control, including, but not limited to, the shortage (whether actual or threatened) of, or the failure of common carriers, suppliers or subcontractors to deliver, necessary raw materials or supplies; embargoes, epidemics, quarantines; unusually severe weather conditions; fires, explosions, floods or other acts of God or the elements; water main breaks; acts of terrorism, war (declared or undeclared) or of a public enemy or other acts of hostility; civil disturbances, insurrections, riots or labor unrest; the threat or actual existence of a condition that may affect the integrity of the supply of any service; the necessity of making repairs to or reconditioning or periodic flushing or cleaning wells, pipelines, transmission lines and other equipment; or the legal requirement or order of any Governmental Authority; provided, however, that any Party subject to the legal requirement or order of any Governmental Authority shall use Reasonable Efforts to defend and take all appeals in opposition to such actions (each of the foregoing, a "Force Majeure Event"), such non-performing party shall not be liable for breach of this Agreement with respect to such non-performance to the extent any such non-performance is due to a Force Majeure Event. Such non-performing party shall exercise all Reasonable Efforts to eliminate the Force Majeure Event and to resume performance of its obligations as soon as practicable.

10.2 Special Notice. Upon the occurrence of a Force Majeure Event, the Party prevented from performing its obligations hereunder shall contact the other Party by telephone as soon as practicable with information available at that time so that the Parties may identify timely and mutually acceptable measures that may be taken to mitigate the effects of the Force Majeure

Event. For purposes of this section, the Parties will provide telephone contact information to each other and ensure that such information is kept current and maintained in the documentation referenced in Section 9.7 hereof. Any further notices of a less time-sensitive nature shall be delivered as provided by Section 14.1 hereof.

SECTION 11. GENERAL PROVISIONS

11.1 Notice. Except as provided in Section 10.2, any notice, report, demand, waiver, consent or other communication given by a Party under this Agreement (each a "notice") shall be in writing, may be given by a Party or its legal counsel, and shall deemed to be duly given: (i) when personally delivered, or (ii) upon delivery by United States Express Mail or similar overnight courier service which provides evidence of delivery, or (iii) when five days have elapsed after its transmittal by registered or certified mail, postage prepaid, return receipt requested, addressed to the Party to whom directed at that Party's address as it appears below or another address of which that Party has given notice, or (iv) when delivered by facsimile transmission if a copy thereof is also delivered in person or by overnight courier within two days of such facsimile transmission. Notices of address change shall be effective only upon compliance with the provisions of the foregoing sentence.

Notice to the Town shall be sufficient if given to:

Town Clerk
Town of Mansfield
4 South Eagleville Road
Mansfield, CT 06268

with a copy to:

Town Manager
Town of Mansfield
4 South Eagleville Road
Mansfield, CT 06268

Notice to CWC shall be sufficient if given to:

President and CEO
Connecticut Water Company
93 West Main Street
Clinton, CT 06413

The Parties shall have the right from time to time and at any time to change their respective addresses and each shall have the right to specify as its address any other address by at least fifteen (15) days written notice to the other Party hereto.

11.2 Entire Agreement. This Agreement, including the schedules and exhibits hereto, constitutes the entire agreement between the Parties pertaining to its subject matter, and it supersedes any and all written or oral agreements previously existing between the Parties with respect to such subject matter.

11.3 Amendment and Modification. No amendment or modification of any provision of this Agreement shall be valid unless the same shall be in writing and signed by both Parties.

11.4 Waiver. Any Party's failure to insist on strict performance of any provision of this Agreement shall not be deemed a waiver of any of its rights or remedies, nor shall it relieve any other Party from performing any subsequent obligation strictly in accordance with the terms of this Agreement. No waiver shall be effective unless it is in writing and signed by the Party against whom enforcement is sought. Such waiver shall be limited to provisions of this Agreement specifically referred to therein and shall not be deemed a waiver of any other provision. No waiver shall constitute a continuing waiver unless the writing states otherwise.

11.5 Governing Law. This Agreement and matters arising out of or related to this Agreement (including tort claims) shall be construed in accordance with and governed by the laws of the State of Connecticut without giving effect to the conflict of laws principles thereof.

11.6 Severability. If any term or provision of this Agreement shall be held to be invalid or unenforceable for any reason, such term or provision shall be ineffective to the extent of such invalidity or unenforceability without invalidating the remaining terms and provisions hereof, and this Agreement shall be construed as if such invalid or unenforceable term or provisions had not been contained herein.

11.7 Relationship between the Parties. Neither of the Parties and none of the agents, employees, representatives, or independent contractors of either Party shall (i) be considered an agent, employee or representative of the other Party for any purpose whatsoever; (ii) have any authority to make any agreement or commitment for the other Party or to incur any liability or obligation in the other Party's name or on its behalf; or (iii) represent to any other Person that it has any right so to bind the other Party hereto. Nothing contained in this Agreement shall be construed or interpreted as creating an agency, partnership, or joint venture relationship between the Parties.

11.8 Parties in Interest. Except as specifically contemplated hereby, nothing in this Agreement is intended to confer any benefits, rights or remedies on any Persons other than the Parties. This Agreement shall not be construed to relieve or discharge any obligations or liabilities of third persons, nor shall it be construed to give third persons any right of subrogation or action over or against any Party. Nothing in this Agreement creates an obligation or liability of the Town to supply or deliver water to third parties.

11.9 Assignment; Successors and Assigns. This Agreement may not be assigned by CWC without the prior written consent of the Town. This Agreement shall not inure to the benefit of any CWC successor without the prior written consent of the Town.

11.10 Interpretation. For purposes of interpretation of this Agreement, the Parties agree that neither party shall be deemed to have been the drafter of the Agreement. The Parties further acknowledge that this Agreement has been arrived at through negotiation, and that each Party has been represented by legal counsel and has had a full and fair opportunity to revise the terms of this Agreement.

11.11 Miscellaneous. The Section headings of this Agreement are for convenience of reference only and do not form a part hereof and do not in any way modify, interpret, or construe the intentions of the Parties. This Agreement may be executed in two or more counterparts and all such counterparts shall constitute one and the same instrument. Delivery of an executed signature page to this Agreement by facsimile transmission or electronic mail attachment shall be as effective as delivery of a manually signed counterpart of this Agreement. The term "including" is by way of example and not limitation.

IN WITNESS of the foregoing, the Parties have executed this Agreement by their duly authorized officers as of the date first set forth above.

TOWN OF MANSFIELD, CONNECTICUT

By: ______________________

Name: Matthew W. Hart
Title: Town Manager

CONNECTICUT WATER COMPANY

By: ______________________

Name: Eric W. Thornburg
Title: President & CEO

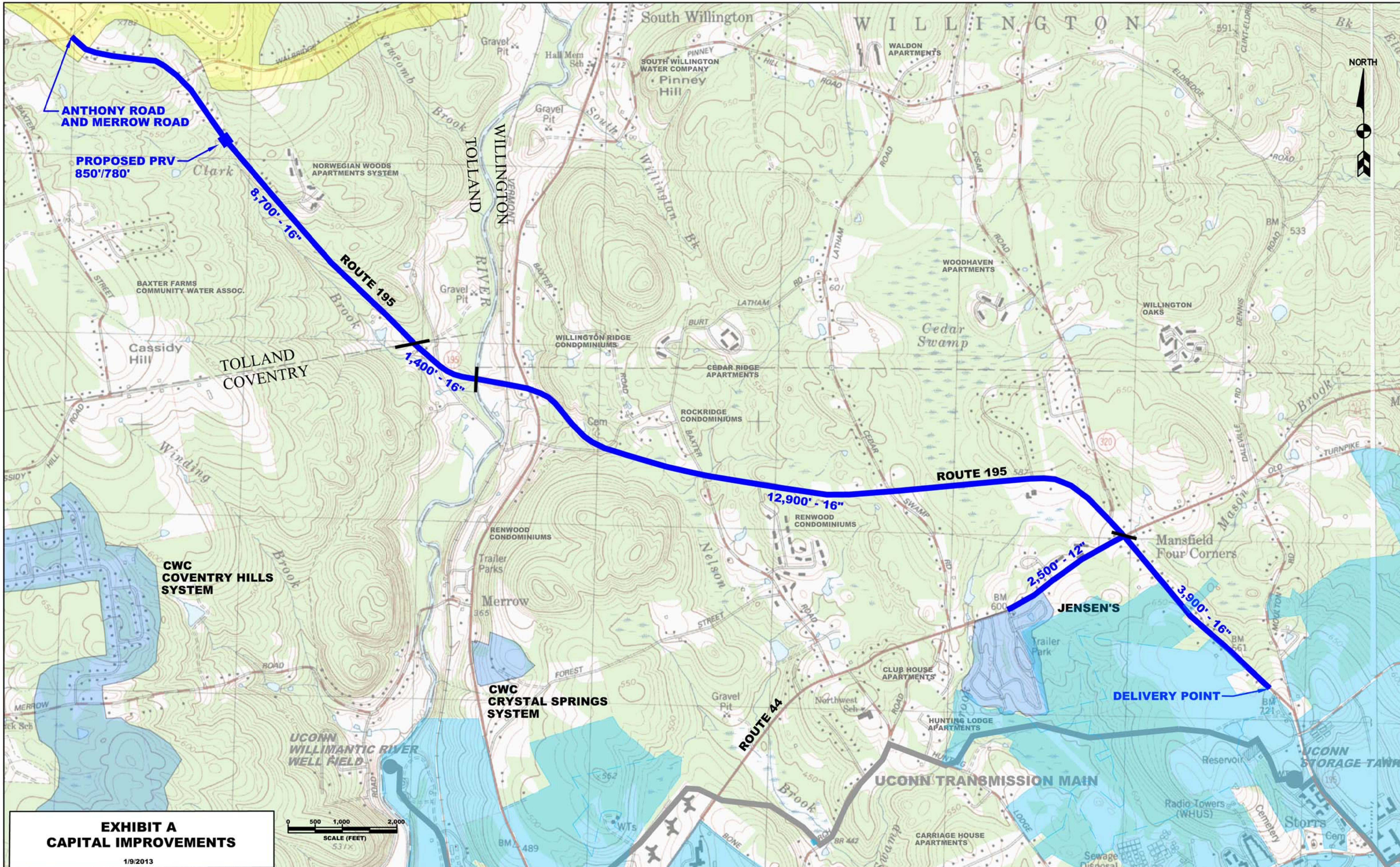

EXHIBIT A
CAPITAL IMPROVEMENTS
1/9/2013

EXHIBIT B

CWC EMERGENCY CONTINGENCY PLAN
WESTERN SYSTEM

The complete CWC Emergency Contingency Plan is part of the Company's approved Water Supply Plan for the entire Northeast Region. The Company would coordinate with UConn on any required actions under their Emergency Contingency Plan.

The attached document provides the relevant section of the CWC plan that details the *Stages of Emergency Contingency Plan – Western System* that could potentially impact operations in Mansfield.

E. Stages of Emergency Contingency Plan – Western System

For systems with multiple groundwater and surface supplies, along with numerous storage facilities, it is not practical to have a single specific trigger level for the various stages of water supply emergencies. CWC has chosen a two-fold approach to deal with these emergencies. The use of predicted days of available supply remaining is useful in dealing with drought conditions, while combined available storage remaining in the distribution system is more appropriate for dealing with treatment, transmission or distribution limitations or emergencies.

The Company's determination of the number of days of supply remaining is calculated as follows:

1.) The Daily Projected Water Usage is the expected daily water production for the system for the particular time of year for which the calculation is being performed. This expected production is based on the historical usage over the prior three years for this time of year, adjusted for known significant changes.

2.) The Daily Projected Production from groundwater sources of supply is based on current production trends as adjusted for actual production achieved from groundwater sources during historic dry years.

3.) The Daily Projected Production from surface water sources of supply is defined as the base inflow into reservoirs determined during historical dry periods. We assume that there is no additional input from precipitation occurring over the time period for which the calculation is being performed.

4.) A Daily Production Adjustment, if appropriate, is calculated based on known changes for the current year to the historical production quantities for surface and groundwater supplies. For example, if a water system has a new well of 0.4 mgd available but has had to decrease well production by 1.0 mgd from other wells due to decreases in groundwater levels, the Production Adjustment would be -0.6 mgd (+0.4 mgd - 1.0 mgd).

5.) The Net Daily Projected Production (from all sources) is calculated by summing the Daily Projected production from groundwater sources, the Daily Projected Production from surface water storage, plus the Daily Production Adjustment (if appropriate). If this value is greater than the Daily Projected Water Usage, the system has greater production capability than is currently being used, and there is no projected emergency situation. If this value is less than the Daily Projected Water Usage, the difference must be provided from surface water storage as shown in (6), below.

6.) The Net Daily Draw to Surface Water Storage is calculated by subtracting the Net Daily Projected Production (from all sources) from the Daily Projected Water Usage, as shown in the formula, below:

$$\text{Net Daily Draw to Surface Water Storage} = \text{Daily Projected Water Use} - \text{Net Daily Projected Production}$$

7.) The Number of Days of Supply Remaining is calculated by dividing the current available surface water storage volume in mg by the Net Daily Draw to Surface Water Storage in mgd. This calculation is summarized below:

$$\text{Number of Days of Supply Remaining} = \frac{\text{Available Surface Water Storage}}{\text{Net Daily Draw to Surface Water Storage}}$$

Stage I – Drought Advisory

Trigger Point:

If cumulative system wide storage, or major hydraulic zone thereof, fails to recover to 60% of capacity (14 MG remaining in storage for total Western system) for 3 consecutive days, or supply reserves fall below 150 days of available supply.

Response Actions:

Maximize use of all CWC sources and the Old County Road, Windsor Locks interconnection with MDC.

Prepare to activate the other three interconnections, Route 5 South Windsor with MDC, Bradley Airport with MDC, and Elm Street Enfield with Hazardville.

Internal notification and preparation.

Contact local and state agencies, including the DPH, concerning the initiation of a Drought Advisory.

Investigate any deviation from normal use registered on production meters.

Develop media messages for bill inserts or direct mailing to distribute to customers summarizing the situation. Customers will be cautioned to avoid wasting water and advised on sprinkling wisely.

Voluntary conservation will be promoted in residential, commercial and industrial facilities to reduce demand by 10 percent from previous non-drought projected usage for the appropriate month.

System Operator is to prepare monthly reports to advise and update state and local agencies of the water supply availability and demand situation.

Review water supply emergency contingency plan and update if necessary.

Stage II – Drought Watch

Trigger Point:

If cumulative system wide storage, or major hydraulic zone thereof, fails to recover to 50% of capacity (11.5 MG remaining in storage for total Western system) for 3 consecutive days, or supply reserves fall below 120 days of available supply.

Response Actions:

Activate and maximize use of all four interconnections, if available.

Contact local and state agencies, including the DPH, concerning the initiation of a Drought Watch.

Internal measures will be implemented to maximize use of existing supplies and to schedule emergency equipment.

All supplementary water sources will be re-evaluated for short-term activation. This would include all "active" sources not currently in full use, as well as emergency sources of supply.

Bimonthly water supply status reports will be prepared by System Operator for evaluation and for distribution to state and local officials.

The media will be contacted to promote voluntary conservation in residential, commercial and industrial facilities to reduce demand by 15 percent from previous non-drought projected usage for the appropriate month. Mailings will be prepared for distribution to customers appealing for stringent voluntary conservation measures. Preparation for mandatory conservation, including necessary enforcement mechanisms, will be initiated.

Evaluation of potential funding needs for actions required under a Drought Watch, Warning or Emergency, will be performed by the Company to ensure the availability of adequate funding through budgets or emergency measures.

Stage III – Drought Warning

Trigger Point:

If cumulative system wide storage, or major hydraulic zone thereof, fails to recover to 35% of capacity (8 MG remaining in storage for total Western system) for 3 consecutive days, or supply reserves fall below 60 days of available supply.

Response Actions:

Maximize use of the interconnections.

Investigate and set up temporary interconnection between the Western system with Agawam, MA along Rte. 159 in Suffield, with the Crescent Lake system to take additional water from East Longmeadow, MA, and with Manchester in the Talcottville area of Vernon.

Contact local and state agencies, including the DPH, concerning initiation of the drought warning plan. This is the first phase of mandatory conservation. At this level, the Company will ban all unnecessary water usage. No outside hose usage will be allowed, nor are in-ground sprinkler systems to be used. A 20 percent reduction in usage from previous non-drought projections for the appropriate month will be targeted.

The media and all customers will be notified on the implementation of the first phase of mandatory conservation.

Local police will be asked to help enforce water use restrictions.

Weekly water supply status reports will be prepared by System Operator for evaluation and for distribution to state and local officials.

A plan will be formulated in concert with state and local officials for strict rationing of water if a drought emergency should be reached. The needs of high priority customers, homes, commerce and fire protection will be established and prioritized. Plans will be made for emergency service of drinking and cooking water by tanker to any areas where normal water service must be terminated.

All possible supplementary water sources will be prepared for use. Coordination with local officials concerning alternative facilities for obtaining water will be initiated, as required.

Re-evaluation of priority among users will be initiated and revised if necessary

Stage IV – Drought Emergency

Trigger Point:

If cumulative system wide storage, or major hydraulic zone thereof, fails to recover to 20% of capacity (5 MG remaining in storage for total Western system) for 3 consecutive days, or supply reserves fall below 14 days of available supply.

Response Actions:

Maximize use of the interconnections.

Continue use of the temporary interconnection with Crescent Lake system.

The remaining available water in the standpipe will be valved off from the system and be available for rationing or fire emergency. A temporary connection with a check valve allowing flow into the tank from the system will be installed to allow the tank to recover when water is available.

The pre-arranged drought hazard rationing plan described above in Phase II, will be initiated in cooperation with appropriate local and state officials, including the DPH. The details of the rationing program will depend upon the nature of the individual emergency but will provide for the bare essentials of life sustenance for as long as possible. The plan will consider needs of high priority customers, homes, commerce and fire protection. Non essential commercial and industrial use would be cut off in accordance with the established priorities. It may be necessary to set a storage minimum to be held for extinguishing fires, the amount needed depending upon the nature of the emergency and structures in the service area. Provision for emergency services for bathing will be coordinated with local officials, and arrangements will be instituted for emergency service of drinking and cooking water by tanker to any areas where normal water service must be cut off. Mandatory rationing of water will be strictly enforced.

It is important to have this type of civil defense response to natural disaster in place in each community to cover all types of emergencies that may result from wind storm, flood, fire, earthquake or large scale accident such as severe contamination of air, land or water by dangerous chemicals. A tank truck spill, or a rupture or leak of an in-ground gasoline, oil or chemical storage tank could suddenly incapacitate a reservoir or a groundwater aquifer, despite the best planning to forestall such an occurrence. The object of planning allowable uses of well and reservoir watersheds is to reduce the likelihood of such an event.

Recovery from Emergency Conditions - As recovery from the emergency conditions is achieved, the level of emergency measures will descend as the appropriate trigger levels are met in the reverse order.

EXHIBIT C
CWC WATER MAIN EXTENSION AGREEMENT

B.U. ___________

Customers Refundable
Partial Advance Payment Agreement

1.) Parties to the Agreement: The following are able and willing to agree:

Company: The Connecticut Water Co., 93 West Main St., Clinton, CT 06413

Applicant: _____

2.) Life of the Agreement: This Agreement shall continue in effect for the useful life of the utility plant installed hereunder, except that the provisions of Sections 8 and 9 will terminate 10 years from the date of execution hereof.

3.) Subject of Agreement: The Company shall acquire, install and provide with water the following described utility plant within a reasonable time after the execution of this Agreement:

Place of installation: Town: _____
Street: _____

Description of plant to be installed:

Mains: Diameter, type and length: _____

Service Connections**:** Diameter, type and number: _____

Other Plant**:** _____

4.) Consideration for Agreement: In lieu of a full cash advance of the estimated cost of CWC installing the plant and equipment that is necessary to provide water service in response to a request for such service by the Applicant, the Applicant shall provide CWC in accordance with CWC specifications and the regulations and the Department of Public Utility Control ("DPUC") and the Department of Public Health regarding design, materials and installation, the complete installation of _____ feet of _____ inch in diameter ductile iron pipe in _____, and additional facilities, if applicable, as set forth in Appendix n/a to this Agreement, at the agreed to estimated cost of $_____ to the Applicant.

In additional consideration of this contract, the Applicant **shall** obtain a waiver and release of all liens or rights of lien that the contractors or subcontractors and material men may have or thereafter have under the laws of Connecticut for services rendered, work performed or materials furnished on the land and buildings of the Applicant or on which the work is performed in favor of the Company and the Applicant, from each contractor, subcontractor or material men hired by the Applicant or from whom the materials are obtained who is associated with the installation and construction of the main extension and, if applicable, additional facilities that are required by the Company in order to provide water service, as listed in Appendix n/a to this Agreement. The Applicant shall provide the Company with an original of the Waiver(s) no more than thirty days after the facilities are put into service. A Waiver and Release of Liens in the form of the Connecticut Title Association Form 1 **if the property in which the plant and equipment will be located is not in the public right of way and title insurance is required by another entity; or a Waiver and Release of Liens Form** that **would** otherwise be acceptable to a Connecticut title insurance company **if such insurance were obtained**, naming the Company as beneficiary, will be sufficient.

The Applicant shall also make a cash advance in the amount of $_____to cover the following Company costs:

Engineering and administrative costs	$_____
Inspection and or installation supervision costs	$_____
Materials and or equipment costs	$_____
Standard service connection fees	$_____
Other	$_____
Describe: _____	

Upon completion of the installation and determination, by the Company, of the actual Company costs the Applicant shall be responsible for payment of the total actual cost, less any prior payments, within 30 days after billing for such costs. Any amounts paid in excess of the actual cost will be refunded to the Applicant within 30 days after actual cost determination.

Both parties agree that this installation, upon satisfactory completion and acceptance by the Company, the submission to CWC of a properly executed Waiver and Release of Liens Form and, **where applicable**, the completed execution of an easement granting CWC access to any plant and equipment installed by the Applicant outside the public right of way shall become property of CWC in accordance with Section 10 of this Agreement. This installation will have a total value to CWC and cost to the Applicant of the previously identified estimated cost of construction plus the total actual Company costs. This total value shall be considered the total Advance paid by the Applicant and shall be used so by CWC in it's determinations under Section 8 and 9 of this Agreement.

Additional costs to be borne by the Applicant at no cost or value to the Company include all excavation and backfill required for service installations, and rock or unsuitable excavation costs.

The Applicant shall provide an easement in accordance with the Company's standard format for all/any Company owned facilities on private property.

Costs shall be determined in accordance with the general accounting practices of the Company.

Meter horn costs included in this contract are as follows:

Size	**Quantity**	**Unit Cost**	**Amount**

Special cost factors: _____

5.) Agreement as to Roadway: Applicant agrees to have all roadway graded to within 12 inches of finished grade and to have grade and line to street clearly marked prior to pipe installation. Roadways will be suitable for the passage of heavy vehicles and for stringing pipe where practicable.

If at any time prior to acceptance by the Town of the street in which the pipe shall be laid, grades of the roadway are changed, the Applicant shall reimburse the Company the full cost of any adjustments in elevation of the pipe or other plant which may be necessary because of such changes.

6.) Limited Service: If any property to be supplied by a main extension to be installed pursuant to this Agreement is at such an elevation that, in the opinion of the Company, adequate pressure cannot be furnished at all times, the Applicant may be obligated to execute a Limited Service Agreement to be recorded in the Land Records of the municipality in which such property is situated.

7.) Conformance to Company Rules and Regulations: This Agreement shall conform to the Rules and Regulations (including main extension regulations) of the Company now in force and on file with the Department of Public Utility Control of the State of Connecticut, which are made a part hereof.

In addition, curb boxes will be locked until a satisfactory inspection of the service line is completed from curb to home and a meter horn is located in the home.

8.) Company Agreement as to Refunds: A refund of $_____will be made by the Company to the Applicant for each new metered service connected to the main extension installed pursuant to this Agreement within 10 years from the date of execution of this Agreement. The combined refunds will not exceed the amount of the total advance payments made by the Applicant.

Refunds will be determined yearly on the anniversary date of this Agreement based on the formula approved by the DPUC. No refund shall be payable to the Applicant pursuant to this Section 8 for any new metered service connection for which a customer makes an equitable advance pursuant to the requirements of Section 9 hereof.

9.) Service to Parties other than the Original Applicant: For a period of 10 years from the date of execution of this Agreement, the Company will require any new customer seeking metered service through a service connection to the original main extension installed pursuant to this Agreement to advance his equitable share of the cost of such original main extension to the Company. That amount shall be reimbursed to the original Applicant who has advanced the cost of such original main extension. If there is more than one original applicant, said reimbursement shall be distributed equitably among said applicants.

10.) Ownership of Plant Installed: The main extension and related service connections and other plant installed pursuant to this Agreement, exclusive of the curb box, shall be the property of the Company. The curb box shall be the property of the Applicant and he shall be liable for its maintenance, its proper grade, and any legal or other actions stemming from or related to the curb box.

11.) Obligations of Parties: This Agreement shall bind and inure to the heirs, executors and administrators, successors and assigns of the parties hereto, but neither the sale nor transfer of his property by the Applicant, nor any other assignment hereunder shall relieve the Applicant of his obligation under this Agreement, unless the written consent of the Company is first obtained.

The Applicant agrees to pay fire protection charges for company facilities on private property at public fire rates until such time as the Town and/or Association agrees to pay them.

Any address or name changes made by the Applicant must be furnished to the Company in writing. The Company's inability to deliver refunds (per Paragraphs 8 and 9 of this Agreement) to the Applicant because of a changed address shall postpone all future refunds until an address change is received from the Applicant. Furthermore, no refunds will be issued or reissued after 10 years from the date of execution of this agreement.

12.) Special Conditions: Applicant agrees to allow The Company or it's agents access to any portion of this water main extension for purposes of maintenance, repair, expansion, extension, etc. until such time as the Town accepts the roads in which the water main is installed. If the Town does not accept the roadway within five years of the execution of this Agreement, the applicant, at their expense, will provide an appropriate easement for all Company owned facilities installed under this Agreement.

Executed and delivered at ______________, Connecticut this ___ day of ___________, 2014.

Witness: (two for each signature)

______________________________	THE CONNECTICUT WATER COMPANY
______________________________	By: ______________________________
	Craig Patla
	Its: Director of Service Delivery
	Region: Northeast
	Address: 25 North Rd., East Windsor, CT 06088
______________________________	______________________________
Witness #1	Applicant
______________________________	By: ______________________________
Witness #2	(Authorized Signature)
	______________________________
	(Print)

RULES AND REGULATIONS

Connecticut Water Division
Crystal Water Division
Unionville Water Division

AS APPROVED BY DPUC ON JULY 14, 2010

For Customer Service Call:

Connecticut Water - 1-800-286-5700

Unionville Office - 860-673-0079

RULES AND REGULATIONS

OF

THE CONNECTICUT WATER COMPANY

Dear Customer:

Providing high quality water and service to all of our customers requires us to have uniform practices. The following Rules and Regulations, which cover our Company's policies and procedures, have been approved by the Department of Public Utility Control. We urge you to read them and keep them for reference.

This booklet focuses on frequently asked questions. It is impossible to anticipate every situation that may arise, so if you have questions that require further explanation, please write or call our Customer Service Center at 1-800-286-5700. If you have further questions or need assistance, you may ask for our Manager of Service Delivery in the office nearest you.

These policies and procedures help us provide you with quality water and service while ensuring fair and equitable treatment for all of our customers. We appreciate your cooperation and compliance with these provisions.

Sincerely,

President & CEO

RULES AND REGULATIONS
OF
THE CONNECTICUT WATER COMPANY

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ABOUT YOUR WATER SERVICE

The Connecticut Water Company is your water utility serving residential, commercial, industrial and municipal customers throughout the state. More than one quarter million people rely on us every day for their drinking water and to provide for public health and safety needs.

We at Connecticut Water are eager to serve you and are committed to providing you with a reliable supply of quality water. We value your business and want you to know that your complete satisfaction is our first concern. Meeting this objective calls for a special service commitment on our part, one which is provided through the efforts of a caring, well trained staff, dedicated to meeting the needs of our customers. At Connecticut Water we are proud of the high quality water and customer service we provide.

Please call our Customer Service Center Monday through Friday, 8:00 A.M. to 4:30 P.M., except holidays, at 1-800-286-5700 if you need assistance for a routine matter such as:

- Account information
- To schedule a service appointment
- A billing question
- A special payment arrangement
- A pending property sale

If you ever need emergency service, call our Customer Service Center anytime, 24 hours a day, at 1-800-286-5700.

Rate schedules and other customer information are available upon request at our offices. The Company maintains service connection records, including service or curb box locations. This information is available to customers upon request.

The Company assists customers whenever possible to locate or mark out existing underground pipes. The Company has equipment available that can locate a leak, thus reducing the cost of repairs, in the event of a leak in a customer's service pipe. The Company will, upon request, send a service person to turn off a curb stop if the customer's main valve is not holding, so that necessary repairs can be made.

If a customer is planning excavation on their property, they need to utilize Connecticut's one-call system, Call Before You Dig, Inc., at 1-800-922-4455 to ensure the identification and proper marking of underground utilities are done prior to the excavation.

We hope these Rules and Regulations will clarify any questions you may have about your water service. If you have further questions or suggestions for improved service, call us at 1-800-286-5700. We will be glad to hear from you.

RULES AND REGULATIONS

(Subject to change without notice)

I. CONTRACT

These Rules and Regulations and all subsequent changes hereto constitute a part of the contract with every customer supplied by Connecticut Water and its operating divisions, and every customer shall be considered to have expressed consent to be bound hereby. These Rules and Regulations are subject to change without notice upon approval of the Department of Public Utility Control.

The Company's regulations regarding water main extensions, as approved by the Department of Public Utility Control, are available as a separate document.

II. DEFINITIONS

Auxiliary Sources: A water supply which is not approved for potable use such as a pond, river, open storage tank, or large swimming pool; or potable water which has become nonpotable, such as by the addition of chemicals or from contamination while the water is being stored or held in reserve; or a private well unless safe sanitary quality and the interconnection is approved.

Company: The Connecticut Water Company and/or any of its operating subsidiaries including Connecticut Water, Crystal Water and Unionville Water.

Cross Connection Control Device: A Department of Public Health approved device for preventing backflow, also known as back pressure or back siphonage device. These devices are required to be installed and tested, in accordance with the requirements of the Public Health Code, at the customer's expense.

Curb Box: Cylindrical iron box with a cover that provides access to curb valve.

Curb Stop: A shut off valve on water service connection generally located at the curb or property line (also referred to as a curb valve).

Customer: Any person, firm, corporation, company, association, governmental unit, lessee who, by the terms of a written lease or agreement, is responsible for the water bill, or owner of property furnished water service by the Company.

<u>Delinquent Account</u>: A water service bill rendered on a monthly basis which has remained unpaid for a period of more than 33 days after the date of mailing of a bill, or a water service bill rendered on a quarterly basis or for a seasonal account which has remained unpaid for a period of more than 63 days after the date of mailing,

<u>DPH</u>: State of Connecticut Department of Public Health.

<u>DPUC</u>: State of Connecticut Department of Public Utility Control.

<u>Family</u>: Individuals living as a single housekeeping unit.

<u>Fire Service Line</u>: A service pipe used exclusively for fire protection purposes.

<u>Main</u>: A water pipe owned, operated and maintained by the Company, which is used for the purpose of transmission or distribution of water but is not a water service pipe.

<u>Meter</u>: A device for measuring the quantity of water, used as a basis for determining charges for water service to a customer. A meter is owned by the Company.

<u>Meter Vault or Meter Pit</u>: An outdoor pit or vault used to house a water meter when no suitable location is available within the premises or if the distance from the curb valve to the premise is greater than 150 feet. Meter pits and vaults, including their covers, shall be owned and maintained by the property owner, and must be constructed in accordance with Company specifications.

<u>Meter Yoke</u>: Piping and valve arrangement approved by the Company used for installing a Company meter. The meter yoke is owned and maintained by the customer.

<u>Premises</u>: Shall include but is not restricted to the following:

a.) A building or combination of buildings owned or leased by one customer, in one common enclosure, occupied by one family as a residence or one corporation or firm as a place of business.

b.) Each unit of a multiple house or building separated by a solid vertical partition wall occupied by one family as a residence or one corporation or firm as a place of business.

c.) A building owned or leased by one customer and having a number of apartments, offices or lofts which are rented to tenants using in common one hall and one or more means of entrance.

d.) A building two or more stories high under one roof owned or leased by one customer and having an individual entrance for the ground floor occupants and one for the occupants of the upper floors.

e.) A combination of buildings owned by one customer, in one common enclosure, none of the individual buildings of which is adapted to separate ownership.

f.) A public building.

g.) A single plot used as a park, recreational area, or for other purposes.

Reasonable Amortization Agreement: A mutually agreed upon promise of a customer to pay an account balance over a reasonable period of time.

Receipt or Received: Three days after the date of mailing, or, if a bill notice or other document is delivered rather than mailed, the date of delivery, unless another date can be shown.

Remote Reading Receptacle: A device installed on the outside of a structure or in an are easily accessible that allow access for meter reading with electronic meter reading equipment.

Seasonal: Water service provided from no earlier than April 1 to no later than November 30 of the same year (dates may vary for individual seasonal systems).

Service Connection: The service pipe, including corporation stop (tap), from the main to and including the curb stop adjacent to the street line or the customer's property line, and such other valves and fittings as the Company may require between the main and curb stop, which are owned and maintained by the Company.

Tap: The fittings installed at the main to which the service pipe is connected.

Termination: The voluntary or involuntary discontinuance of water service to an individual customer.

III. GENERAL RULES

a) Water service and use, and any special charges are charged in accordance with the DPUC approved rate schedules. All metered water, whether used or lost, shall be paid for by the customer.

b) The piping and plumbing on all premises supplied from the Company's water system shall conform to the State of Connecticut Public Health Regulations and Building Code and Sanitary Codes, if any, of the town in which the premises are located.

c) No customer shall supply water to other persons or permit any connection to be made on his/her premises for supply to other premises, without approval of the Company for "temporary service".

d) No pipe or fixture connected with the mains of the Company may be connected with pipes or fixtures supplied with water from any other auxiliary source.

Such cross connections are in violation of the Connecticut Department of Public Health regulations. The customer shall be responsible for the installation of cross connection control devices. Such installation shall be approved and inspected by Company personnel and must be in conformance with the applicable provisions of the Public Health Code. All devices shall be easily accessible for inspection and testing. The customer shall be responsible to have any devices tested that are so required by the public health code and shall provide a written copy of the test results to the company for annual reporting to the Department of Public Health. Any customer who fails to provide the test results to the Company may be charged a Cross Connection Second Notice Fee, as approved in the company miscellaneous charges.

e) Authorized employees of the Company shall have reasonable access to customers' premises for the purpose of reading, testing, repairing, installing or replacing meters and meter appurtenances; inspecting plumbing connections, fixtures or pipes, or discontinuing service. Services rendered after hours or on weekends or holidays are subject to special charges.

f) Customers are responsible for keeping their service pipe, house pipes and fixtures in good order and protected from freezing. Failure to do so may result in interruption of service and costly repairs, for which the Company is not liable.

g) Whenever possible, work requiring the interruption of service will be scheduled to provide the least inconvenience to the customer. The Company will make a reasonable effort to give notice in advance of work requiring the interruption of service. To safeguard against possible damage due to interruption of service, customers are advised to regulate their installations connected with the water supply system, (i.e. check valves on water heaters) so that damage will not occur if water is shut off without notice.

h) Whenever the public interest so requires, the Company reserves the right to curtail or suspend entirely the use of water for non-essential purposes. Such limitation of use shall be without liability on the part of the Company.

i) Filling of tank trucks for any purpose shall only be done at company designated locations with approved backflow prevention under the direction of company personnel.

j) Customers who plan to install air conditioning or refrigeration equipment totaling over three tons in capacity shall provide water conserving equipment.

k) WATER PRESSURE

   i. The Company will undertake to provide an adequate supply of potable water at adequate pressure throughout its system, but cannot assume responsibility or liability, direct, indirect or consequential, for any damage from failure to do so.

   ii. In areas where pressure is low, the Company may recommend and/or require that customers install, operate and maintain a booster pump and tank of a combined capacity approved by the Company. In such cases, customers will enter into a written agreement with the Company in which they hold the Company blameless for possible damages and inconvenience resulting from the low pressure.

   iii. In areas where pressure is high, the Company may recommend and/or require that customers install and maintain pressure-reducing valves (PRV). In such cases, the Company shall not be responsible for any possible damages or inconvenience resulting from the high pressure or failure of the PRV.

   iv. If there is not sufficient pressure or flow in a particular system of the Company to permit a customer to qualify for preferred risk insurance, the expense for any improvement in the system for this specific purpose shall be borne by the customer.

   v. In the event that any customer shall use water at rates of flow that cause noticeable pressure variations in the water system, the Company may require that the customer control their flow rates or install equipment to minimize such variations to an acceptable level.

IV. APPLICATIONS AND TRANSFERS

a.) Applications for the installation of new water service shall be made on forms provided by the Company and signed by the applicant, or a duly authorized representative, for service of the premises to be supplied. Service connection fees are payable in advance. The Company may require appropriate identification such as a Social Security number, a driver's license, or a state issued identification card.

b.) The Company will not accept an application for service from a customer having a delinquent water account, until the account has been paid in full.

c.) Transfers may be authorized in writing or by verbal request through the Company's Customer Service Department.

d.) Customers shall notify the Company when premises are to be vacated so that the water may be turned off, the meters read and/or removed, or the account transferred. If the premises are to be permanently abandoned, owners shall notify the Company in writing immediately so that the service connection can be closed. Closure will be made at the Company's expense.

e.) Water for construction purposes shall be applied for on forms provided by the Company. All such water used must be metered, and charged in accordance with DPUC approved rate schedule.

f.) When the Company renders temporary or intermittent service to a customer, it may require that the customer bear the costs in excess of any salvage realized of installing and removing the service.

g.) Applicants desiring to connect to a main already under contract may be required to pay the Company an amount which, in its judgment, represents their equitable share of the original costs of the main.

h.) Applicants taking service from an extension of main under special contract, as approved by DPUC, may be required to pay the Company an equitable share of the original cost of a pump station, storage tank or other facility.

i.) Payments to the Company as share of original costs for a main extension will be refunded to the original depositors.

V. **SERVICES -** (See Appendices A-D for typical service installation diagrams)

a) A single service may not supply more than a single premise. If a premises presently served by a single pipe is divided and no longer under the ownership of a single owner, it shall require installation of corresponding additional service pipes.

b) When an applicant applies for service, except in conjunction with new main extensions, the Company will furnish, install, own and maintain such new service connections and will bear the cost of the service pipe from the main to the curb stop. The Company shall install and own the corporation and the curb stop and the applicant will be charged for furnishing and installing the curb box. The applicant will bear the costs of excavation, backfill removal and replacement of paving, walks, curbs, etc., necessarily incurred with respect to new services, and will be responsible for obtaining necessary permits and complying with safety requirements including shoring and all other trenching safety requirements. Services installed in conjunction with new main extensions shall be paid for by the customer or applicant based on the Company's approved service connection fees, during the life of the main extension contract.

c) All services, new or renewed, for year round use shall typically be laid at a minimum invert depth of five feet below ground surface.

d) All services, except those for private fire protection, shall be metered. The Company may meter private fire lines if it so desires.

e) All new and renewed service connections with meters up to 1" in diameter are required to have installed, at the customer's expense, a meter yoke which meets Company standards.

f) All new and renewed services shall be sized and constructed to comply with the Company's current design criteria and shall be a minimum of 1" in diameter. Service pipes normally shall be Type K Copper with no soldered joints underground, or cement-lined ductile iron.

   In some instances the Company may approve the use of plastic pipe. Service piping of any material except Type K Copper shall conform to the specifications and installation standards of The Connecticut Water Company. Such pipe shall be PE 3408 SDR 9 CTS polyethylene, rated from 200 psi working pressure, or PE 3406 SDR 9 polyethylene, rated from 160 psi working pressure, with this information and the NSF seal appearing on the pipe. A 12-guage tracer wire will be placed directly above each service line for the full length of the installation for ease in locating. Its use must have advance approval of the Company, be acceptable under the requirements of the town building codes, and be inspected prior to burying the service line.

The Company will not allow any plastic service within 500 feet of any commercial or industrial zoned area or any area with underground fuel tanks.

g) Installation of new or renewed services is not allowed in easements or right of ways, without prior DPUC approval.

h) All services shall be provided with a curb valve and curb box at the curb or at a convenient point prescribed by the Company between the curb and property line.

   i) Seasonal service lines with a vertical rise shall be equipped with a stop and waste valve with an operating rod and valve box outside the building between the Company's curb valve and the building, regardless of meter location.

   ii) Where more than one building on the premises is supplied by a single service, the branch line to each building shall have an underground shutoff valve box and operating rod outside the building.

i) When replacement of a service connection is made at a customer's request for change in location or size of the service, the customer shall bear the full expense of relocation or enlargement. Maintenance of water piping installed within a private development and supplied from one service connection to the Company's main, shall be the responsibility of the private development, unless the water piping is owned by the Company with suitable easement rights by previous negotiation. Repairs may be made and billed for by the Company by pre-arrangement with the owners.

j) The customer, at their own expense, shall furnish, install, own and maintain the service pipe from the curb stop to the interior of the building and shall assume ownership of a Company approved curb box, keeping service pipe and box in good repair and keeping the curb box readily accessible. If the curb box is not accessible for Company use, the Company has the right to make it accessible and/or operable and bill any cost to the customer. Installation of this section of the service line should be performed by a licensed plumber or in accordance with those provisions defined in Section 20-340 of the Connecticut General Statutes.

k) The customer shall inform the Company prior to backfill in order that the Company may make an inspection and test to assure that the service pipe and installation complies with Company requirements. Testing is to include pressurizing the service pipe and a visual inspection of all joints for leakage. After inspection and approval of the trench, the depth of invert of the service may not be reduced to less than 5'-0", nor may any connection be made to the service pipe between the street shutoff and the meter. If the customer does not schedule the inspection prior to backfill, the Company may require that the pipe be re-excavated at the customer's expense to allow the Company to perform the necessary inspection. No service pipe shall be turned on without prior approval by the Company.

l) The customer shall assume the responsibility and expense of maintenance of customer's portion of the service pipe. Such service pipe shall be protected from freezing. Thawing of metallic service pipe, when required, may be done by the Company and the customer charged a special fee in accordance with the DPUC approved rates and charges. Such services shall be lowered at the customer's expense to prevent repetition of freezing. The Company cannot thaw freeze-ups in plastic service pipes or in service pipes located entirely within a private development served through one service connection.

m) The customer is responsible for repairing all leaks and for other repairs, renovations and maintenance to all customer owned pipe, fixtures and equipment. If a leak develops in a customer service line or a customer owned service connection, the customer shall repair it without delay. When there is a leak in any service pipe from the curb box to the customer's premises and the owner cannot be readily found or shall refuse to make immediate repairs, the Company shall have the right, but not the duty, to make the necessary repairs and charge the customer for the same. If such repair work is not completed within a reasonable period specified by the Company (by telephone, in person or in writing to the customer), the Company may discontinue service until the leak is repaired, or repair the leak itself.

n) The service pipe shall extend through that point on the customer's property line or the street line easiest of access to the utility from its existing distribution system and from a point at right angles to the existing or proposed distribution line in front of the premises to be served. If a multiple premises building is positioned at right angles to the existing distribution line, a new distribution line placed in an easement shall be necessary to permit right angle services to each premises. New or reconstructed service pipes shall not cross intervening properties. The approval of the Company shall be secured as to the proper location for the service pipe.

o) Water service may not be laid in the same trench with other underground utility facilities. Separation distances of at least ten feet (measured horizontally) shall be maintained between any existing or proposed sanitary sewer piping, sewer manholes, septic tanks or any portion of a subsurface sewage disposal system.

p) No service pipe shall cross any portion of a septic system or be installed less than 10 feet from any portion of a septic system.

q) All underground lawn sprinkling systems shall be equipped with proper backflow prevention devices. Plans for such a system shall be approved by the Company before the installation is made, and the Company's final on-site inspection and approval is required before backfilling.

r) If an existing multiple family house is being served by a single service and meter, and a part of the house changes ownership, the new owner shall be required to install a separate service and meter.

s) Restoration of an abandoned service will be considered a new service installation.

t) SEASONAL CUSTOMERS

   i) Customers who wish to convert from seasonal to year round service shall obtain prior approval from the appropriate town officials and make the installation in conformance with Company specifications. The customer shall be responsible for lowering service to a minimum invert depth of five feet below ground level.

   ii) Seasonal services of less than five feet in depth shall be pitched toward the customer's stop and waste valve which shall be located between the house and curb shutoff, and depending on soil conditions, the Company may require that it have a permanently installed extension operating rod. Such services shall be drained when not in use. The Company will not be responsible for damages done to services which have not been properly drained. Services for building without cellars shall have underground stop and waste valves between building and curb shutoff.

   iii) Customers who wish to convert from seasonal to year round or vice versa may make the conversion only once.

u) FIRE SERVICES

   i) The installation of combined fire and domestic services will not be permitted without special approval of the Company. Prior to installation of fire sprinklers on any domestic service less than 2", the Company shall be notified in accordance with Section 19a-37a-1 of the Connecticut Public Health Code. Such sprinklers may only be installed on piping that is metered. No meter bypasses are permitted for such installations. It is the customer's responsibility to have the system designed and installed in accordance with all applicable state and local regulations. The Company makes no claim of reliability or adequacy of such system for fire protection. Such installation will not prevent the Company from pursuing normal termination procedures.

   ii) If a fire pump is desired at a customer's location, the pump curve data must be provided to the Company for review and approval prior to installation to determine if the location is suitable for a pump.

VI. METERS and METER EQUIPMENT

a) The Company shall determine the type, size and installation of the meter to be installed. All premises must be separately metered.

b) The customer will provide, at their expense, an accessible and protected location for the meter and any meter reading equipment, which location shall be subject to the approval of the Company at the time of service pipe installation.

The meter may be located inside a building when, in the opinion of the Company, an inside setting will provide adequate accessibility, protection against freezing or other damage to the meter, and when the service pipe from street line to place of use does not exceed 150 feet in length. A setting within a building shall be located just inside the cellar wall at a point which will control the entire supply, exclusive of fire lines, to the premises.

When no suitable place inside the building is available, or the service pipe exceeds 150 feet in length, the Company may require that the meter be set near the street shutoff with suitable valve in a pit at least five feet deep, with a cover. Pit and cover shall be approved by the Company. Meter pits or vaults, including the meter vault cover, become the property of the customer upon installation, and the customer is responsible for the maintenance and repair of the vaults as needed from time to time. Meter pits or vaults should be kept accessible and free of debris, which will help prevent the meter from freezing or being otherwise damaged.

c) Meters will be owned, installed, tested and removed by the Company. Damage due to freezing, hot water, faulty connections, or customer's negligence shall be paid for by the customer.

d) The customer is requested to notify the Company promptly of any defect in or damage to the meter or its connections.

e) The Company may, at its discretion, install remote meter reading devices on its customers' meters. The location of such remote meter reading devices shall be determined by the Company, with any outside meter reading touch pad located a minimum of 36" from the ground and in a location that is safe and accessible for the meter reader. Customer requests for these installations will be reviewed on the basis of necessity.

f) The Company may not be required to install a meter until all the requirements for a new service installation have been met, including the installation of a meter yoke.

g) In order to assure accuracy, the Company may at any time remove a meter for tests, repairs or replacement. At a minimum, meters will be tested periodically in accordance with the regulations of the Department of Public Utility Control. Customers shall allow the Company access to their property for such periodic meter tests.

h) Upon written request of a customer, the Company will test without charge to the customer, the accuracy of a meter in use at his premises provided the meter has not been tested by the Company or the DPUC within one year prior to such request.

i) Upon a request by a customer or an order by the DPUC, the Company shall notify the customer in writing within one week of the request that he/she, or his/her authorized representative, has the right to be present during the test. If the customer wishes to be present for the meter test, he shall notify the Company within 10 (ten) days of the written notification to arrange to be present for the test. The Company shall schedule a convenient time for all parties as its meter testing facility as soon as possible. A written report of the results of the test shall be furnished to the customer. The customer shall agree to abide by the results of such test as the basis for any adjustment of disputed charges. If the customer prefers, the DPUC can witness a test of the meter at a location other than the Company's own testing facility. The customer is responsible for all DPUC fees associated with witnessing a test.

j) Submetering shall be permitted only with the approval of the Company and the Department of Public Utility Control.

k) If a service cannot be shut down for periodic testing and removal of the meter, a second meter will be required.

l) No person, other than a Company employee, shall break seals or disconnect meters unless specifically authorized in writing by the Company to do so. If any person takes such action without authorization from the Company, that person will be liable for any damages which may result therefrom, and shall be billed on the basis of water used in a similar period.

m) The Customer is responsible for maintaining piping on either side of the meter in good condition and valved on both sides of the meter so that the meter may be removed or replaced conveniently and without damaging such piping. If a problem should develop subsequent to meter removal or replacement due to poor condition or the piping or hand valve, the customer shall be responsible for any necessary repairs and damage.

n) Seasonal meters will be removed by the Company at the time service is shut off, tested, stored and replaced in the spring. Some seasonal meters are equipped with drain cocks and can be drained for the winter by the customer or its agent without removal. Seasonal activations and deactivations are done on a schedule determined by the Company. Customers are notified in advance by mail of the seasonal schedules. Customer requests to activate or deactivate their account on alternate dates shall be made to the Company with at least three days notice. Only Company personnel are authorized to operate the curb valve.

o) Customers who satisfy all the requirements of the Company and their town officials for converting from seasonal to year round service will become metered customers subject to the Company's effective metered rates.

p) Swimming pools or other facilities, which might require considerable quantities of water, may be required to be separately metered and to have separate services. Customers are not permitted to fill pools with water directly from hydrants. The Company may pursue appropriate enforcement action and may assess a usage fee based on estimated metered consumption.

q) The Company can assume no responsibility for the clogging of interior house plumbing or flooding which may occur during or after interruption of service or repairs to services, meters or mains.

VII. BILLING AND COLLECTION

a) Separate premises shall be separately billed.

b) Customer billing, including fire protection charges, is monthly or quarterly with the frequency for an account determined by the Company based on the days of service, classification and consumption.

c) When a meter reading is not available, an estimated bill will be rendered.

d) Bills are payable when rendered. Failure of the customer to receive the bill or notice does not relieve him/her from the obligation of payment or from the consequences of its non-payment.

e) The property owner is generally the customer of record and is responsible for payment of water bills. However, if the property is rented or leased, the tenant may be the customer if a written lease or agreement specifies that the tenant is responsible for the water bill. The Company's usual procedures for applying for water service should be followed in either case.

f) The Customer shall be liable for all charges for water service until such service has been disconnected by the Company pursuant to instruction from the customer or until the Company receives a notice of change in ownership or change in lessee.

g) Meters still in place will continue to be billed for a minimum meter charge unless customer requests water be turned off and meter removed. If the customer requests the water be turned off and the meter removed before the end of the billing period, the meter charge will be prorated to reflect the actual number of days in service during the billing period.

h) Bills for seasonal service shall be rendered at the time the meter is installed or a connection is made and the minimum charge payable in advance for the seasonal period. Prorated charges will be made in cases where premises are occupied for the first time after July 1.

i) Where a premise is supplied by two or more meters connected to a single service, the minimum charge for each meter shall be applied and the registrations combined in the computation of consumption charges. Where a premise is supplied through more than one service, the minimum charge shall be applied to each meter and the registrations shall not be combined. Combined billing will not be allowed except where approved by the DPUC.

j) Guarantee contracts are billed semi-annually in advance with semi-annual adjustment for actual revenue received.

k) Water for construction purposes, or for tank trucks, will be metered in accordance with the Company's approved rates and charges.

l) Miscellaneous sales are billed as the service is rendered.

m) Bills that are incorrect due to meter or billing errors will be adjusted based upon Section 16-11-71 of the Regulations of Connecticut State Agencies. Whenever a meter in service is tested and found to have over-registered more than two percent, the Company will adjust the customer's bill for the excess amount paid determined as follows:

   i) If the time at which the error first developed can be definitely determined, the amount of overcharge shall be based thereon.

   ii) If the time at which the error first developed cannot be definitely determined, it shall be assumed that the over-registration existed for a period equal to one-half of the time since the meter was last tested. If more than one customer received service through the meter during the period for which the refund is due, a refund will be paid to the present customer only for the time during which they received service through the meter.

   iii) Whenever a meter in service is found not to register or meter reading is not available, the Company may render an estimated bill. The Company will estimate the charge for the water used by averaging the amount registered over a similar period preceding or subsequent to the period of non-registration or for corresponding periods in previous years, adjusting for any changes in the customer's usage.

   iv) Billing adjustments due to fast meters will be calculated on the basis that the meter should be 100% accurate. For the purpose of billing adjustment, the meter error shall be one-half of the algebraic sum of the error at a maximum test flow plus the error at intermediate test flow.

   v) When a customer has been overcharged as a result of incorrect reading of the meter, incorrect calculation of the bill, incorrect connection of the meter, or other similar reasons, the amount of the overcharge will be refunded or credited to the customer.

   vi) When a customer has been undercharged as a result of incorrect reading of the meter, incorrect calculation of the bill, incorrect connection of the meter, or other similar reasons, the Company may bill or otherwise hold the customer financially liable for no more than one year after the customer receive such service per State Statute 16-259(a).

VIII. DENIAL OR TERMINATION OF SERVICE

a) Refusal or discontinuation of service by a water company is restricted by certain provisions of Connecticut General Statues and of the regulations of the DPUC. Copies of the applicable statutes and regulations are available for inspection at all of our offices.

b) Notices regarding termination of service shall:

   i) Be sent via first class mail at least 15 days before the termination.

   ii) Contain the grounds for termination.

   iii) Contain explanation of customers' rights.

c) New service may be denied or termination proceedings may be started by the Company for any of the following reasons and carried out subject to the aforementioned restrictions.

d) Service may be terminated <u>without</u> notice, again subject to certain restrictions, for:

   i) A condition determined by the Company to be hazardous.

   ii) In the event of illegal or unauthorized provision of service.

e) Service may be terminated <u>with</u> notice, for:

   i) Non-payment of a delinquent account, provided the Company notified the customer and is in compliance with all of the procedures prescribed in Section 16-3-100 (c) through (h) of the Regulations of Connecticut State Agencies.

   ii) Failure by a customer to comply with the terms of any agreement where under they are permitted to amortize the unpaid balance of an account over a reasonable period of time, or any failure for such a customer to simultaneously keep their account for utility service current as charges accrue in each subsequent billing period. Except where the customer has made a payment or payments amounting to 20% of the balance due, in which case the Company shall not terminate service until further notice of the conditions the customer must meet to avoid termination is sent to the customer. Such notice shall not entitle the customer to further review as provided by Subsection VII e-1 of these regulations or to additional notice upon subsequent payment of 20% of the balance due.

iii) Violation of or non-compliance with the Company's Rules and Regulations.

iv) When the Company has discovered that a customer has obtained unauthorized water service by fraudulent means or material misrepresentation or has diverted the water service for unauthorized use or has obtained water service without same being properly registered upon the Company's meter.

v) Tampering with the equipment furnished and owned by the Company.

vi) Failure of the customer to permit the Company reasonable access to its equipment during normal working hours.

vii) Failure of the customer to make necessary service line repairs after reasonable notice to avoid the wasting of water.

viii) Failure of the customer to furnish such service, equipment, permits, certificates or rights of way as shall have been specified by the Company as a condition to obtaining service, or if such equipment or permissions are withdrawn or terminated.

ix) Failure of non-residential customer to fulfill their contractual obligations for service or facilities subject to regulation by the DPUC.

x) Customer use of equipment in such a manner as to adversely affect the Company's equipment or the Company's service to others.

xi) Failure or refusal of the customer to reimburse the utility for repairs to or loss of utility property on the customer's property when such repairs are necessitated or loss is occasioned by the intentional or negligentful acts of the customer or their agents.

xii) Failure to comply with the Public Health Code of the State of Connecticut pertaining to cross connection control requirements at the premises.

xiii) When the Company has determined that the furnishing of water service would be contrary to any orders, ordinances of laws of the federal or state government or any political subdivision thereof.

xiv) Failure of the customer to provide identification within 15 days of opening an account.

f) Termination proceedings may be started by the Company for non-payment of a delinquent account, provided that the Company has notified the customer of the delinquency and has made a diligent effort to have the customer pay the delinquent account. A termination notice to a customer whose account is delinquent will be mailed no earlier than 63 days after mailing the original quarterly bill or 33 days after mailing the original monthly bill. Actual termination of the service will not occur earlier than 13 days after mailing the termination notice.

g) The Company will not terminate service to a customer if:

i) The customer has filed an unresolved complaint or dispute with the Company and/or the DPUC. Such complaints must be made to the Company within seven days of receipt of a termination notice. Such complaint shall be reviewed by the Company as prescribed by Section 16-3-100 (g) of the Regulations of Connecticut State Agencies;

ii) There is known to be serious illness in the home of a residential customer. The Company must be notified by a doctor within 13 days of a customer's receipt of a termination notice, and such notice must be confirmed by letter within a week after the verbal notification. The notice must be renewed every 15 days or the last day of the period specified by the physician as to the length of the illness. The customer is required to make a reasonable arrangement with the Company to pay the delinquent part of his/her bill, and to pay all future bills on a current basis while the illness continues;

iii) The customer of record is a landlord or agent for an individually metered occupied residential rental property, and the delinquent bill is for water service to that property. If practicable, arrangements may be made with the tenant for payment of bills for future service, and appropriate legal action may be taken against the customer for the delinquent and current amounts. However, if reasonable arrangements have been made with the tenant and the tenant refused to cooperate, the Company may terminate service to the tenant upon proper notice;

iv) The customer of record is a landlord or agent for an occupied residential rental property, and for water service to that property where the meter services multiple units/tenants. In the event such account is delinquent bill, the Company may pursue payment through the rent receivership process or other appropriate collection methods.

v) The day immediately prior to a weekend or holiday except under conditions as set forth in sub-paragraph (d)(i) of this section where there is determined to be a condition that is hazardous.

IX. PRIVATE FIRE SERVICE

a) Fire hydrants and sprinkler systems shall be installed and maintained at the expense of the customer. The size, material and locations of piping, and plans and specifications for any tanks and pumps that may be required, shall be submitted in writing to the Company for approval. The Company must inspect the installation before backfill and must witness the pressure test and all flow tests for compliance with the approved plans and specifications. The Company may meter private fire lines where there is demonstrated justification such as unauthorized use of the service and/or where unusual circumstances prevail in the customer's premises.

b) Prior to the installation of any fire sprinkler system, the Company shall be notified in accordance with Section 19a-37a-1 of the Connecticut Public Health Code.

c) A backflow prevention device shall be required on a line to a fire sprinkler system with any siamese connection in accordance with the Connecticut Public Health Code.

d) Operating tests of private fire hydrants and sprinkler systems shall be made only after notification to and approval by the Company.

e) No water shall be taken from a private fire hydrant except for use on the property in which it is located, nor for any purpose other than to extinguish fires or to test fire fighting equipment. Such uses of water for purposes other than fire fighting shall be made only after notification to and approval by the Company.

f) The Company shall not be held liable or responsible for any losses or damage resulting from fire or water which may occur due to the installation of a private fire service system or any leakage or flow of water therefrom.

g) In cases where a private development is to be served by a single service connection and ownership of the single service pipe or distribution main is not held by the Company, a separate fire service main may be required to accommodate private fire hydrant service.

h) With Company approval, a single fire service may service more than a single premise.

i) The customer shall provide the Company with approval from the local fire marshal and a letter from their insurance carrier acknowledging that the fire service is being disconnected before a customer's request for discontinuance of a private fire service can be processed by the Company. The owner is responsible for billings until terminated.

X. FIRE PROTECTION CHARGES

a) All public fire hydrants, except certain town owned hydrants, shall be owned and maintained by the Company.

b) Any hydrants and mains located on public property, easement, or a public right of way are subject to public fire charges and billed to the municipality.

c) Any mains located on private property, easement, or private right of way that are installed at the expense of a private property owner and any hydrants installed by the company on such mains shall be owned and maintained by the Company and are subject to the Fire in Private Rights of Way charges and billed to the property owner.

d) Fire departments desiring to use water from hydrants for testing equipment or for any purpose other than that of extinguishing fires, must notify the Company in advance of such usage.

e) Persons who desire to use water from public hydrants for purposes other than fire fighting must first obtain permission from the Company. Persons using water without permission of the Company shall be prosecuted to the full extent of the law.

XI. COMPANY RESPONSIBILITIES

a) The Company undertakes to supply its customers with water which meets the requirements of the State of Connecticut Department of Public Health, and which has such physical and chemical properties as to make it acceptable for domestic use. However, the Company does not undertake to render any special service, to maintain any fixed pressure, to deliver any fixed quantity of water, or special quality water.

b) The Company shall not be liable for any damage to person or property, sustained as a result of any break, failure or accident in or to its system or any part thereof, which is not due to the Company's negligence, or which, being known to the customer, was not reported by that customer in time to avoid or mitigate such damage.

c) Company employees performing work at a customer’s premises, shall wear a company uniform or carry a badge or other identification card identifying him/her as a company employee.

XII. NOTES

XIII. APPENDIX

a.) Diagram - Typical Water Service Installation

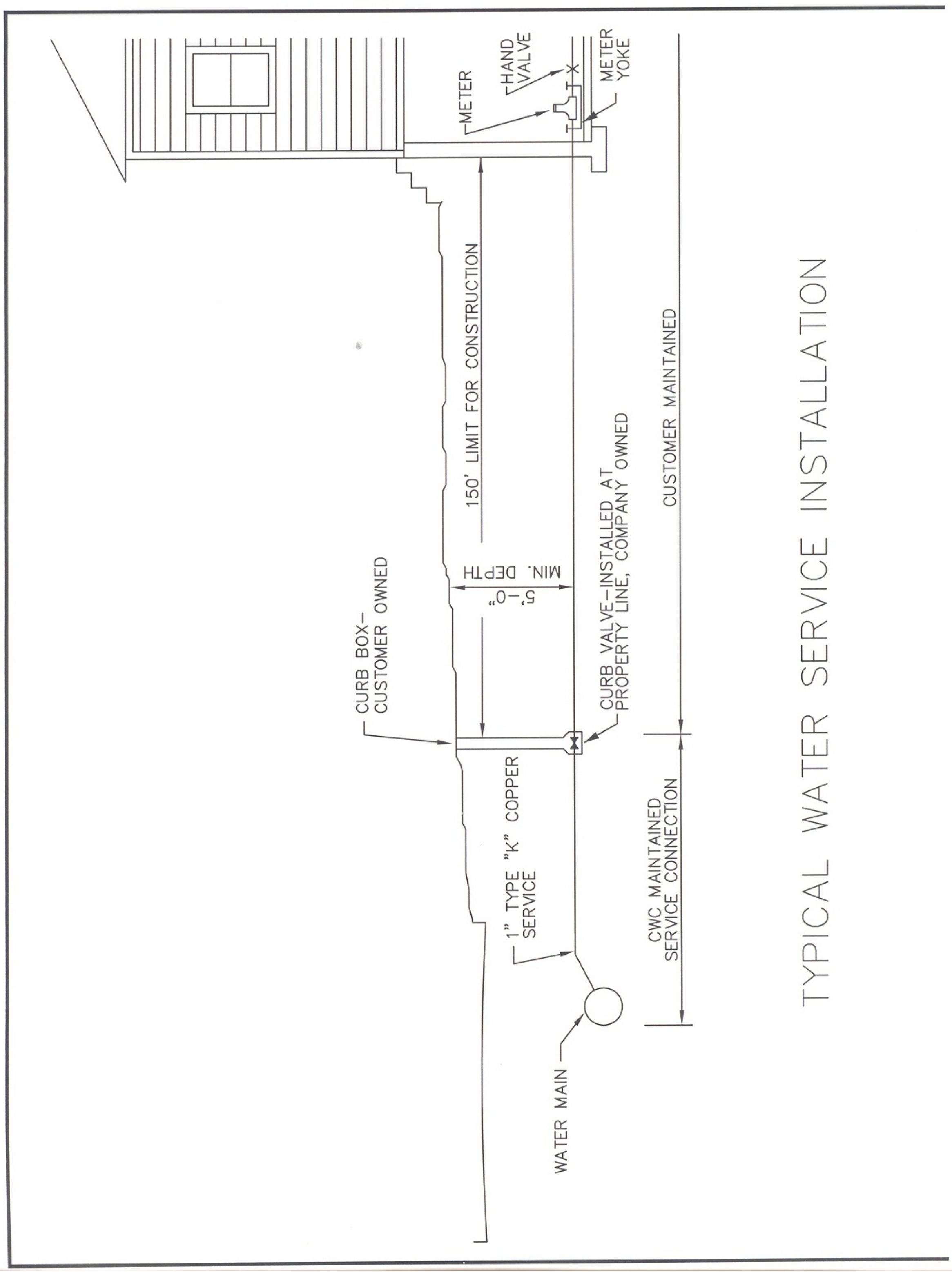
b.) Diagram - Typical Water Service Installation with a Meter Pit

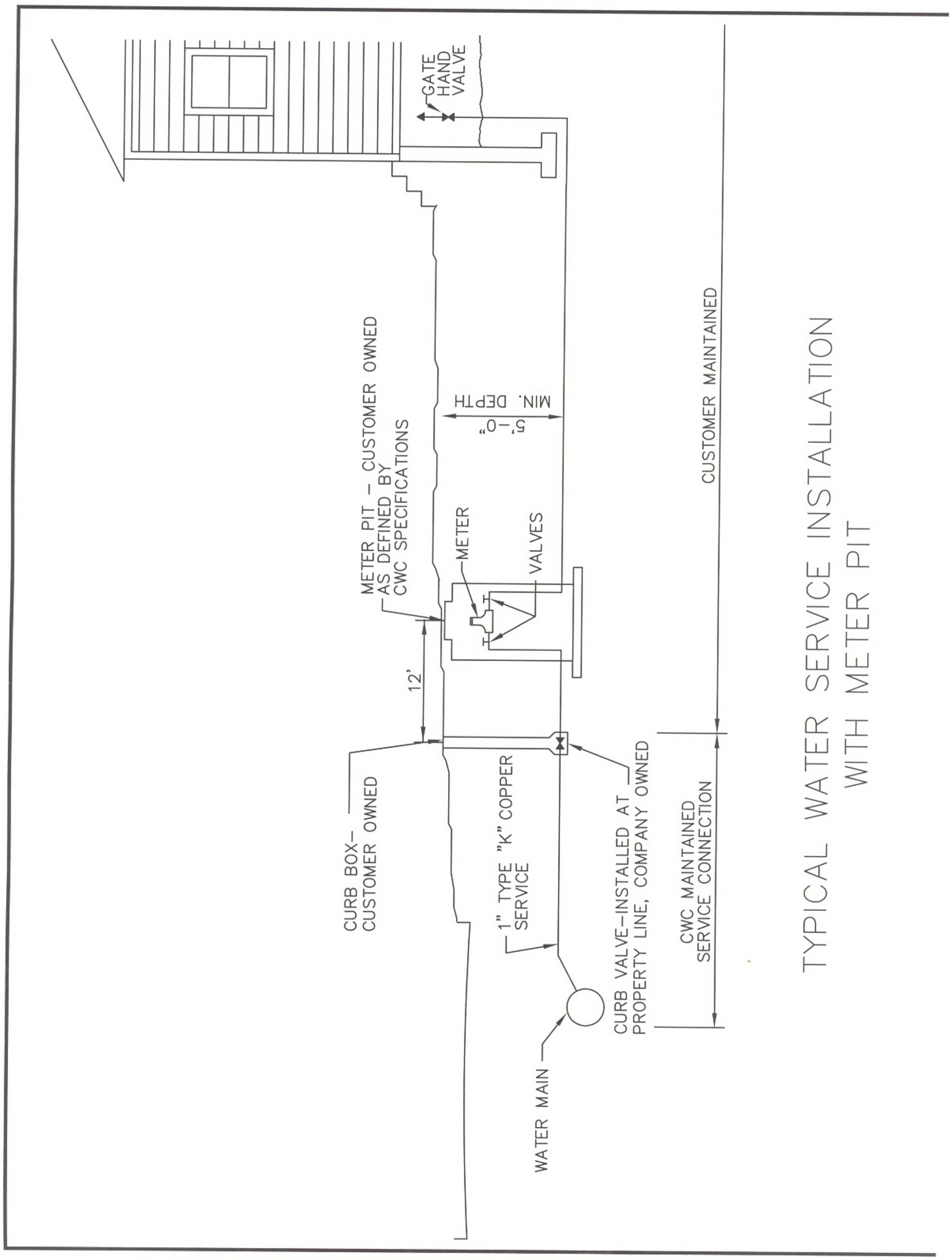
c.) Diagram - Typical Seasonal Water Service Installation

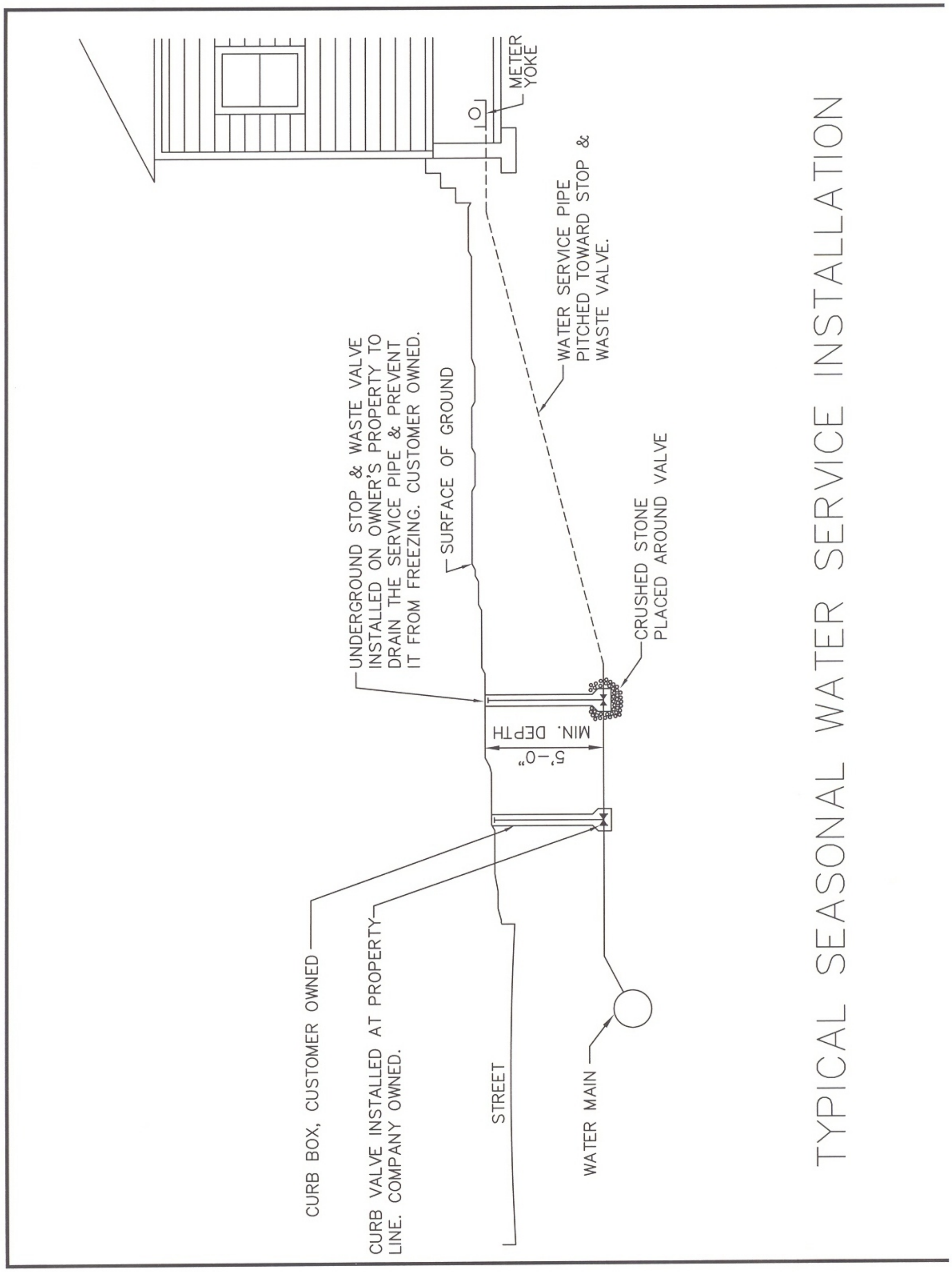
d) Diagram - Typical Meter Yoke Installation

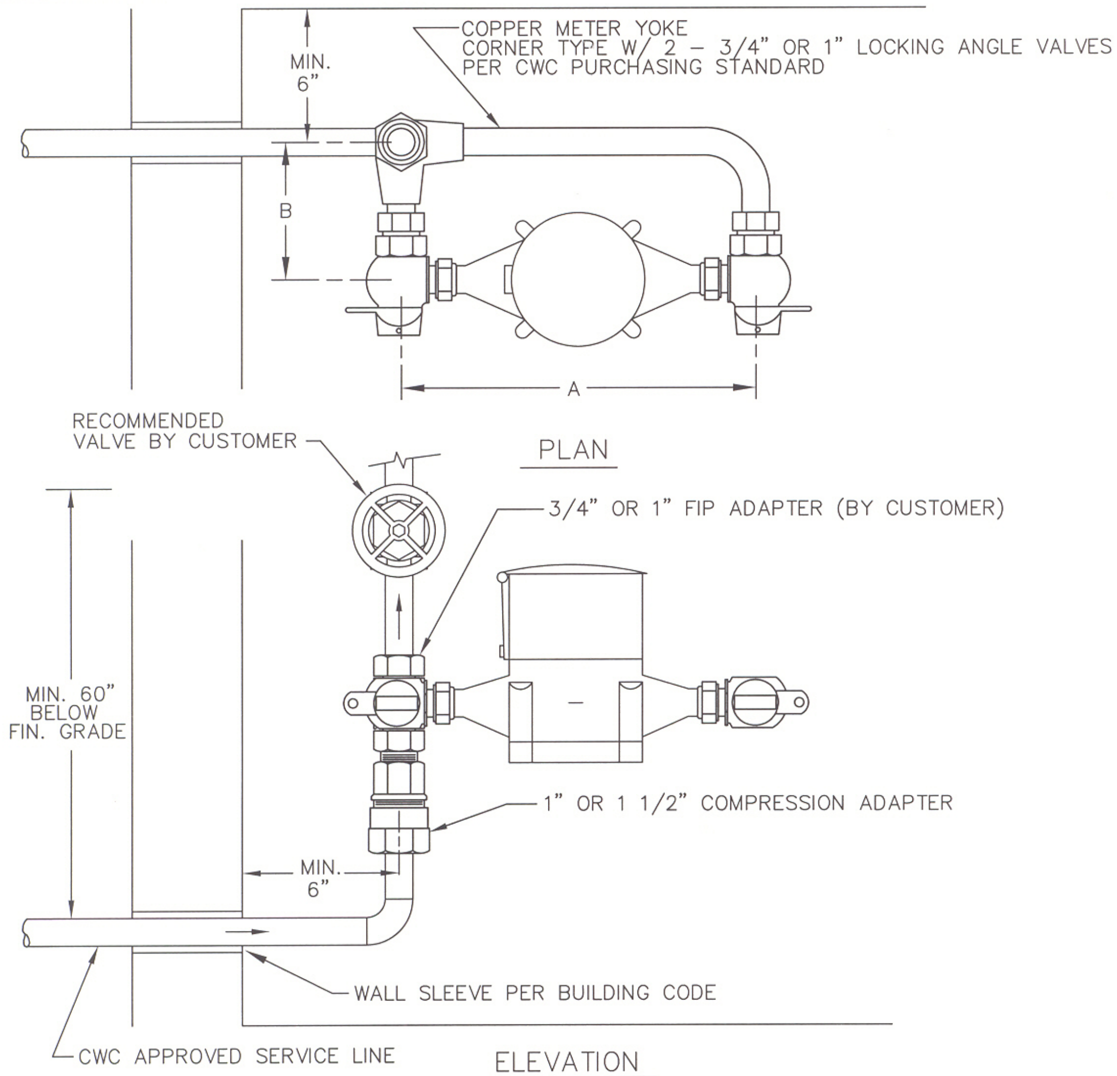
e) Diagram - Typical Meter Yoke Installation with PRV

f) Customer Information – Your Water Service


TYPICAL WATER SERVICE INSTALLATION
METER
HAND VALVE
METER YOKE
150' LIMIT FOR CONSTRUCTION
CUSTOMER MAINTAINED
CURB VALVE-INSTALLED AT PROPERTY LINE, COMPANY OWNED
MIN. DEPTH 5'-0"
CURB BOX-CUSTOMER OWNED
1" TYPE "K" COPPER SERVICE
CWC MAINTAINED SERVICE CONNECTION
WATER MAIN

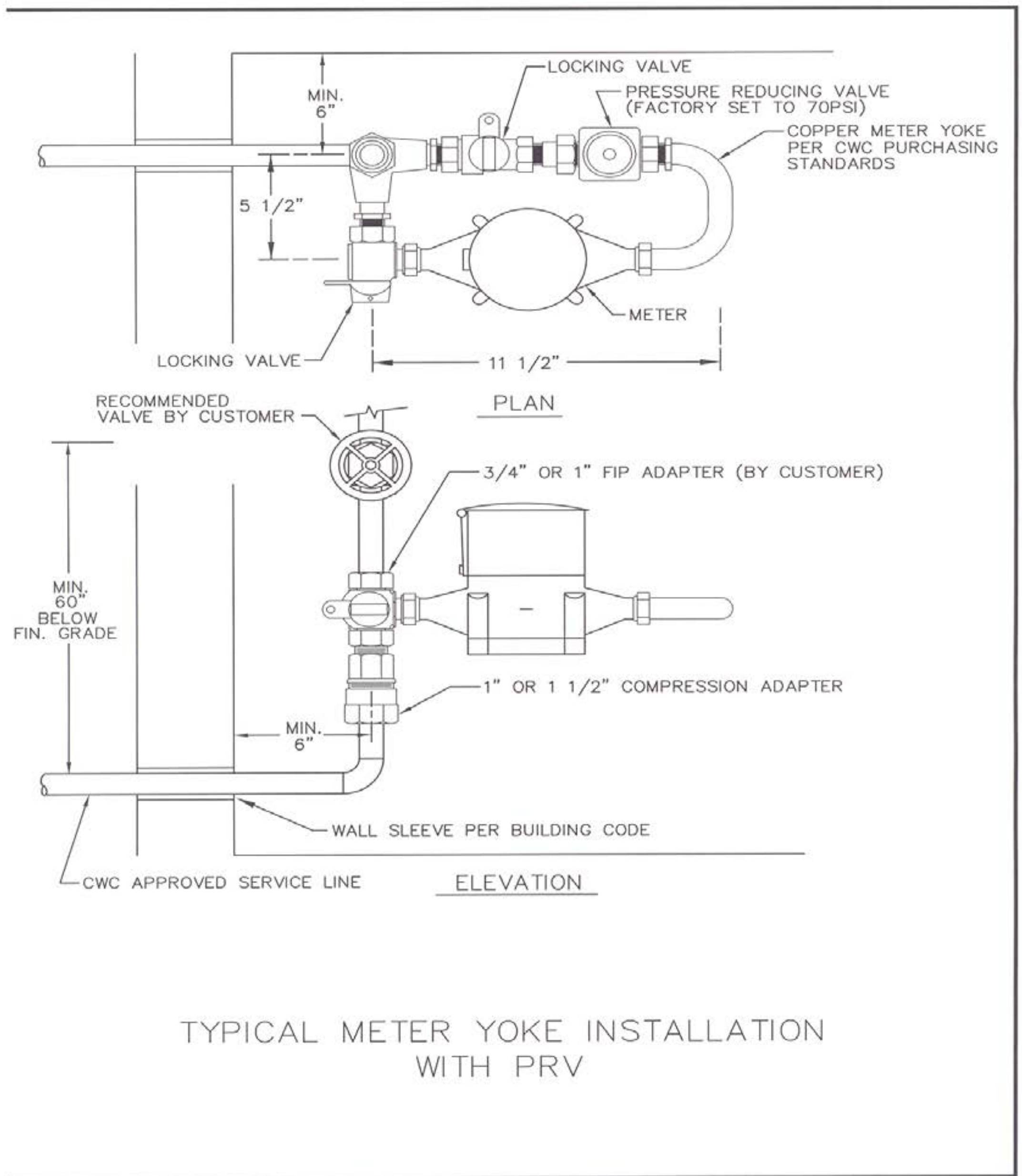

GATE
HAND
VALVE
METER PIT – CUSTOMER OWNED
AS DEFINED BY
CWC SPECIFICATIONS
METER
VALVES
5'–0"
MIN. DEPTH
CUSTOMER MAINTAINED
12'
CURB BOX–
CUSTOMER OWNED
1" TYPE "K" COPPER
SERVICE
CURB VALVE–INSTALLED AT
PROPERTY LINE, COMPANY OWNED
CWC MAINTAINED
SERVICE CONNECTION
WATER MAIN
TYPICAL WATER SERVICE INSTALLATION
WITH METER PIT


TYPICAL SEASONAL WATER SERVICE INSTALLATION
METER YOKE
WATER SERVICE PIPE PITCHED TOWARD STOP & WASTE VALVE.
UNDERGROUND STOP & WASTE VALVE INSTALLED ON OWNER'S PROPERTY TO DRAIN THE SERVICE PIPE & PREVENT IT FROM FREEZING. CUSTOMER OWNED.
SURFACE OF GROUND
CRUSHED STONE PLACED AROUND VALVE
5'-0" MIN. DEPTH
CURB BOX, CUSTOMER OWNED
CURB VALVE INSTALLED AT PROPERTY LINE. COMPANY OWNED.
STREET
WATER MAIN



METER SIZE	DIM "A"	DIM "B"
5/8"X 3/4"	11 1/4"	4 1/2"
3/4"	12 3/4"	4 1/2"
1"	15"	5 1/2"

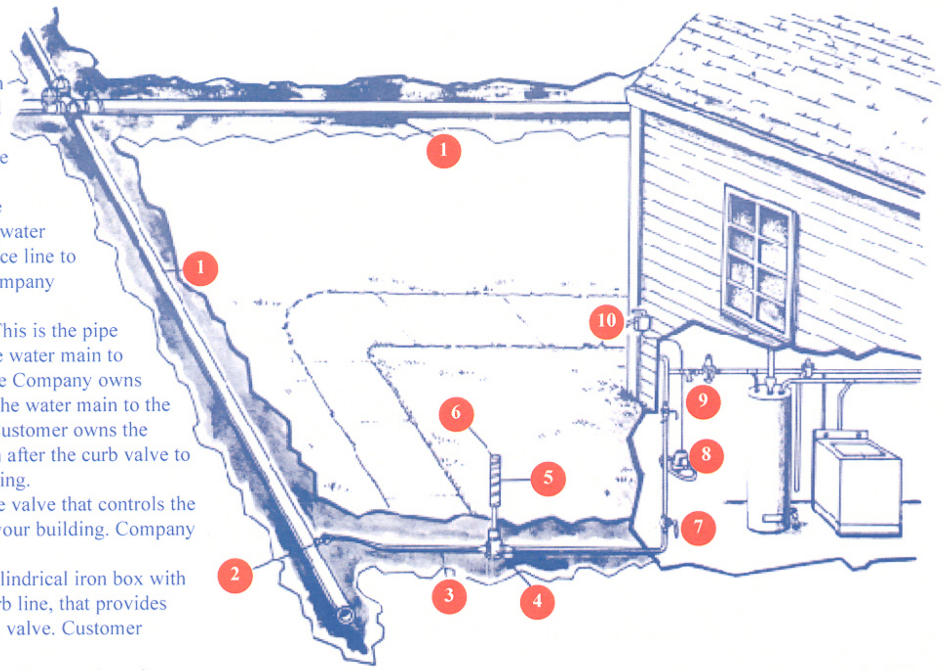
TYPICAL METER YOKE INSTALLATION


LOCKING VALVE
PRESSURE REDUCING VALVE
(FACTORY SET TO 70PSI)
MIN.
6"
COPPER METER YOKE
PER CWC PURCHASING
STANDARDS
5 1/2"
METER
LOCKING VALVE
11 1/2"
PLAN
RECOMMENDED
VALVE BY CUSTOMER
3/4" OR 1" FIP ADAPTER (BY CUSTOMER)
MIN.
60"
BELOW
FIN. GRADE
1" OR 1 1/2" COMPRESSION ADAPTER
MIN.
6"
WALL SLEEVE PER BUILDING CODE
CWC APPROVED SERVICE LINE
ELEVATION
TYPICAL METER YOKE INSTALLATION
WITH PRV

APPENDIX F

Your Water Service

There are many components necessary to provide water service to your home. This illustration identifies the components of a typical residential water service and the responsibility of the water company and the customer for these components.



1 Water Mains: Miles of water mains carry treated water from our reservoirs and wells to your premises. They are Company owned.

2 Tap: This is the connection at the water main for the service line to your building. Company owned.

3 Service Line: This is the pipe that goes from the water main to your building. The Company owns the portion from the water main to the curb valve. The Customer owns the remaining portion after the curb valve to and into the building.

4 Curb Valve: The valve that controls the flow of water to your building. Company owned.

5 Curb Box: A cylindrical iron box with a cover, at the curb line, that provides access to the curb valve. Customer owned.

6 Curb Box Cover: Protects the valve and keeps the box free of dirt and foreign matter. Customer owned.

7 Cellar Valve (may be part of a meter horn assembly): Controls the flow of all water coming into the premises. Valve and meter horn are Customer owned.

8 Water Meter (usually located inside the building): Records how much water is used. It is Company owned, but the customer is responsible for any damages (freezing, vandalism, external causes, etc.) and may be charged for repairs or replacement.

9 Pressure Reducing Valve (only in high pressure areas): Controls and regulates the pressure of water coming into the building. Customer owned.

10 Remote Meter Reading Receptacle: Permits us to obtain meter readings without entering the premises. Company owned.

EXHIBIT E
SUMMARY OF PRINCIPAL LAWS APPLICABLE TO THIS AGREEMENT

REGULATORY OVERSIGHT

CWC is subject to regulatory oversight by state and federal agencies and actions are handled in a public process, and information related to permits or compliance is readily available from the agencies. The primary regulatory oversight is:

- DPH with regard to the purity and adequacy of its supplies;
- Department of Energy and Environmental Protection (DEEP) regarding water resources and environmental permitting, and
- PURA with respect to rates and quality of service.

Customers in the Town of Mansfield shall be afforded all the rights and protections available to all Connecticut Water customers as a result of such oversight. A summary of applicable laws and statutory references shall be included as an exhibit in the Definitive Agreement.

Among the key provisions governing a private water company by the Public Utilities Regulatory Authority that protect customers and the community are:

Rates and Surcharges of Public Service Companies	
Establishing rates *CGS § 16-19*	Amendment of rate schedule; investigations and findings by authority; hearings; deferral of municipal rate increases; refunds; notice of application for rate amendment, interim rate amendment and reopening of rate proceeding.
Water company rate adjustments *CGS § 16-32c*	Requires notice to customers in advance of any general rate increase; opportunity to provide comments on the request
Water meters may be required *CGS § Sec. 16-260*	Water company may refuse to furnish water, except by metered measurement at established rates, to the owner or occupant of any premises upon which water is allowed to be wasted by reason of defective fixtures, or otherwise, after notification to such owner or occupant and reasonable time given to him to make necessary repairs.
Water company rate adjustment mechanisms *CGS § 16-262w* *PA 13-78*	Allows for Water Infrastructure and Conservation Adjustment (WICA) Charge between general rate cases for PURA approved eligible projects. Allows for Revenue Adjustment mechanism to annually adjust rates to recover revenues as authorized in last rate case.

Service Termination	
Termination of utility service for nonpayment *CGS § 16-262c, 16-262d* *Regs. CT State Agencies § 16-3-100*.	Defines process and notice requirements for termination of utility service for nonpayment. **Nontermination in event of illness during pendency of customer complaint or investigation. Amortization agreement. Appeal. Notice re credit rating information** Provisions for amortization agreements and hardship cases. Privacy of individual utility customer usage and billing information.
Notice furnished tenants re intended termination of utility service CGS *§ **16-262e***	Specific protections for tenants and limitations on termination of service. where landlord pays for water service
Action for receivership CGS *§ **16-262f***	Special provisions for collection of rents in multi-family situations
Service Quality & Obligation to Serve	
Inadequate service or unreasonable rates; petition to the authority *CGS. § 16-20*	If company unreasonably fails or refuses to furnish adequate service at reasonable rates to any person which the company has authority to furnish the service, the person may bring a written petition to PURA alleging the failure or refusal.
Revocation of franchises *CGS. §* **16-10a**	PURA, on its own initiative, or upon complaint of any town or on petition of not less than five per cent of the affected persons, shall investigate into any alleged failure to provide such service as it deems necessary. May result in revocation of franchise as to any such town or any portion thereof, or make such other order as may be necessary to provide such service.
Economic viability of water companies. *CGS. § § 16-262n*	Provides for investigation by DPH and PURA and orders as necessary to review the economic viability of a water company, based upon performance measures of the company's stability and financial condition, technical and managerial expertise and efficiency, and physical condition and capacity of plant.

Department of Public Health Rules and Regulations	
CGS. § 25-32e	Imposition of civil penalties for violations of certain drinking water laws and regulations.
CGS. § 25-34.	Investigation of water or ice supply.
CGS. § 25-40	Analysis of water. Schedule of fees, when applicable.
CGS. § 25-51	Injunction against injury to water supply or source.
CGS. § 19a-38	Fluoridation of public water supplies.
CGS. § 19a-37a	Regulations establishing standards to prevent contamination of public water supplies. Civil penalties.
Conn. Agencies Regs. § - 19-13-B102	Standards for quality of public drinking water
Conn. Agencies Regs. § - 19-13-B80.	Chemical substances in public water supplies.
Conn. Agencies Regs. § 25-32e-1.	Civil penalties for violation of certain drinking water laws.
CGS. § 25-32d.	Water supply plans.
CGS. § 25-42.	Power to take lands and streams.
CGS. § 25-33 et seq	Water company reporting and record retention requirements. Plan required for construction or expansion of a water supply system or a proposed new source of water supply.
CGS. § 25-32b.	Public drinking water supply emergency.
Conn. Agencies Regs. § 25-33h-1	Coordinated water system plans.
Conn. Agencies Regs. § 25-32d-1a et seq	Source water protection measures.

EXHIBIT F
RATES AND CHARGES OF UCONN AS OF EFFECTIVE DATE OF AGREEMENT

University of Connecticut
Water Rate Schedule
Effective as of Sept. 13, 2011

WATER CHARGES

Connection Charge	$0
Domestic Water Use Metered Charge	$3.05 per 100 cubic feet $4.078 per 1000 gallons
Domestic Water Meter Fee	$100 per year
Domestic Water Use Flat Rate[1]	$340 per year

FIRE PROTECTION FLAT RATE:

Private Fire Charges

Connection Size	Annual Charge	Quarterly Charge
1"	$ 16.10	$ 6.2267
2"	$ 84.36	$ 23.2939
3"	$ 239.46	$ 62.0682
4"	$ 506.97	$ 128.9455
6"	$1467.06	$ 368.9671
8"	$3123.01	$ 782.9555
10"	$5613.90	$1405.6794
12"	$9066.19	$2268.7520

Public Fire Charges

	Quarterly Charge	Monthly Charge
Per Hydrant	$60.00	$20.00

[1] Domestic water use flat rate is reserved only for connections that do not have a water meter or a written agreement with Supplier. The Water Supply Rules and Regulations require that all connections have a water meter.

Miscellaneous Fees and Charges

Bulk water account activations	$50
Bulk water commodity charge	Metered rate = $3.05 per 100 cubic feet $4.078 per 1000 gallons
Unauthorized hydrant use	$200
Unauthorized water use	$300
Curb box repairs – equipment required	$300
Curb box repairs – hand dug	$100
Cross connection notice fee	$40

Special Charges

Service turn off (normal hours)	$40
Service turn off (after hours)	$60
Service turn on (normal hours)	$40
Service turn on (after hours)	$60
Service turn on- large meter <: 2” (normal hours)	$40
Service turn on- large meter <: 2” (normal hours)	$60
Service turn on at curb (normal hours)	$40
Service turn on (after hours)	$60
Service turn on – seasonal activation	$20
Frozen meter charge	$50
Frozen meter charge (after hours)	$75

Collection Fees

Returned check fee	$30
Late payment fee	1.5% per month[2]

[2] The interest charges are applied at the time of billing and are applied to past due amounts only. Monthly customers would have a one-month interest charge applied at the time of billing and quarterly customers would have a three-month interest charge applied at the time of billing (3 times the monthly interest rate).

Exhibit G

TOWN INFRASTRUCTURE

Town infrastructure shall mean the Town owed water distribution infrastructure as of the effective date of the Agreement including:

1. Water lines installed in 1979 to connect to the Senior Center and Senior Housing area on Maple Road:

    a. Approximately 2242 feet of 6 inch ductile iron water main running along the south side of South Eagleville Road (CT Route 275) from the meter pit installation near Separatist Road to the intersection of Westwood Road and South Eagleville Road, including valves and other appurtenances.

2. Water lines installed in 2013 for the Storrs Center development:

    a. Approximately 536 feet of 12 inch ductile iron water main running in the Town's road (Royce Circle) from the intersection of Bolton Road Extension and Royce Circle south and east to a point in Royce Circle near the entrance to the parking garage at 33 Royce Circle, including hydrants, valves and other appurtenances.

    b. Approximately 1120 feet of 12 inch ductile iron water main running in the Town's road (Wilbur Cross Way) from the intersection of Royce Circle and Wilbur Cross Way south to a water main owned by UConn in Charles Smith Way, including hydrants, valves and other appurtenances.

WATER SUPPLY AND DEVELOPMENT AGREEMENT

THIS AGREEMENT, is made and entered into as of the 18th day of December, 2013, by and between THE UNIVERSITY OF CONNECTICUT, a non-profit state institution of higher education, organized under the laws of the State of Connecticut, with principal administrative offices at Storrs, Connecticut, ("UConn") and CONNECTICUT WATER COMPANY, a Connecticut corporation having its principal offices at Clinton, Connecticut ("CWC").

RECITALS

WHEREAS, UConn operates and maintains a system of registered water diversions at its facilities in Storrs, Connecticut; and,

WHEREAS, UConn desires to secure a supplemental supply of potable water to address future increases in water demand at its facilities in Storrs, Connecticut; and,

WHEREAS, pursuant to the Connecticut Environmental Policy Act, C.G.S. §§ 22a-1 *et seq.*, and regulations promulgated thereunder (collectively "CEPA"), UConn has completed an environmental impact evaluation and record of decision for potential sources of water supply, and selected CWC as the proposed water supplier as detailed therein; and,

WHEREAS, the Connecticut Office of Policy and Management has reviewed the referenced environmental impact evaluation, record of decision and related documentation, and determined that UConn has satisfied the requirements of CEPA; and,

WHEREAS, CWC is a public service company subject to the jurisdiction of the Public Utilities Regulatory Authority with public water supply infrastructure extending into Tolland, Connecticut; and,

WHEREAS, CWC upon the receipt of required approvals from Governmental Authorities and construction of the proposed infrastructure, shall be ready, willing and able to provide UConn with the water supply service specified in this Agreement.

NOW, THEREFORE, for and in consideration of the foregoing and of the mutual covenants, promises, obligations and undertakings contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, UConn and CWC (hereinafter, collectively "Parties" and individually a "Party") hereby agree as follows:

SECTION 1. DEFINITIONS AND ADOPTION

1.1 Definitions. As used in this Agreement, the following terms have the respective meanings set forth below:

"Basic Service Charge" shall mean the PURA-approved monthly charge to be paid by a CWC water customer based on the meter size of the customer service connection and the applicable schedule of approved rates for CWC Year Round customers, or a successor charge established by PURA to replace the use of the Basic Service Charge.

"Billed Customers" shall mean those persons, associations, partnerships or corporations of record as having a legal obligation to pay for Potable Water supply service as the owners of real property receiving water or tenants thereof having an obligation to pay for water pursuant to an agreement with the real property owner.

"Campus Connection Spur" shall mean the pipeline, valves and related appurtenances and work to interconnect Meter Pit A to other elements of the UConn System.

"Capital Improvements" shall mean the water supply pipeline, pumping stations, pumping station upgrades, pressure reducing valves and related appurtenances and work to be performed by CWC to interconnect the CWC system at Anthony Road and Merrill Road in Tolland to the UConn system at the Delivery Point and the infrastructure on Middle Turnpike that would serve the Four Corners, identified on the attached Exhibit A and hereby incorporated into this Agreement.

"Connecticut General Statutes" or "C.G.S." shall mean the State of Connecticut General Statutes, Revision of 1958, revised to 2013, and as revised and amended from time to time.

"Completion Date" shall mean the date of UConn's written acceptance of CWC's written notice of completion of construction and testing of Capital Improvements, or the date occurring 60 days after UConn's receipt of the CWC written notice of completion, whichever first occurs, provided, that UConn has completed construction of the Campus Connection Spur, and, provided further, that UConn has not delivered to CWC within such 60 day period a notice that there are items not completed in accordance with the terms of this Agreement or the conditions of any Licenses or Permits ("Deficiency Notice").

"CTDEEP" shall mean the Connecticut Department of Energy and Environmental Protection, or its successor as established by Law.

"CTDPH" shall mean the Connecticut Department of Public Health, or its successor as established by Law.

"CWC Regulations" shall mean the Rules and Regulations of the Connecticut Water Company as approved by PURA on July 14, 2010, and revisions and amendments thereto not inconsistent with this Agreement.

"Deficiency Notice" shall mean a circumstance as specified with respect to the Completion Notice as noted above.

"Delivery Point" shall mean the connection between CWC infrastructure and UConn infrastructure at Meter Pit "A".

"Diversion Permit" shall mean an authorization issued by the CTDEEP pursuant to the Water Diversion Policy Act, C.G.S. §§22a-365 *et seq.*, as amended, in such form as required by CTDEEP for the purpose of authorizing CWC to provide water to UConn as required by this Agreement.

"Exclusive Service Area" shall mean an area where public water is supplied by one system as established by the CTDPH pursuant to C.G.S. §§25-33c *et seq.*, as amended.

"Existing Customers" shall have the meaning set forth in Section 3.2(a) hereof.

"Freedom of Information Act" or "FOIA" shall mean the Freedom of Information Act as set forth in C.G.S. §§1-200 *et seq.* and amendments thereto.

"Governmental Approval" means any authorization, consent, approval, license, franchise, lease, ruling, permit, tariff, rate, certification, exemption, filing or registration by or with any Governmental Authority (including zoning variances, special exceptions and non-conforming uses).

"Governmental Authority" means any federal, state, departmental or municipal government or any political subdivision thereof, and any other entity exercising executive, legislative, judicial, regulatory or administrative functions of or pertaining to government, and any other governmental entity but excluding in all cases UConn.

"Law" or "Laws" shall mean federal, state, local, foreign or other laws, regulations, orders, injunctions, building and other codes, ordinances, permits, licenses, judgments, decrees of federal, state, local, foreign or other authorities, and all orders, writs, decrees and consents of any governmental or political subdivision or agency thereof, or any court or similar Person established by any such governmental or political subdivision or agency thereof but excluding in all cases UConn.

"Licenses and Permits" shall mean any license, permit, registration, certificate, order, approval, franchise, variance and similar right issued by or obtained from any Governmental Authority or any third party that is required in connection with the operation of a Party's water supply system, the Capital Improvements or the Supply Source Improvements.

"Meter" shall mean a water volume measuring device (meeting design, type and specifications per industry standards and PURA regulations) that is used for the purpose of measuring water volumes as provided in this Agreement).

"Meter Pit A" shall mean the meter pit to be constructed by UConn in the Town of Mansfield, on the west side of Route 195 at the location indicated on Exhibit A.

"Net Volume" shall mean and be calculated as the water delivered by CWC to the Delivery Point, reduced by: i) the total of the volume of metered water delivered by CWC to CWC customers downstream of the Delivery Point and served by the Capital Improvements, and ii) the volume of metered water delivered to non-university customers in the UConn Technology Park for which the revenues will be transferred by UConn to CWC, and increased by a percentage adjustment established annually by the Parties to reflect a reasonable estimate of the volume of nonrevenue water (e.g. system leaks, fire flows) in the system supplied by CWC downstream of the Delivery Point and via the Capital Improvements. In the event that either Party reasonably believes that the method of calculating Net Volumes described above is inaccurate, the Parties agree to meet and negotiate in good faith to arrive at an alternate method of calculating Net Volumes that is more accurate, provided that alternate method can be accomplished at a reasonable cost and is in conformance with prevailing industry practices.

"New Customers" shall have the meaning set forth in Section 3.2(c) hereof.

"Notice of Completion" shall mean a written notice from CWC confirming the completion of all necessary or appropriate construction and testing of Capital Improvements in conformance with the requirements of the Agreement.

"Peak Day Demand Volume" or "PDDV" shall have the meaning set forth in Section 2.1(a) hereof.

"Person" shall mean any natural person, estate, partnership, corporation, trust, unincorporated association, limited liability company, joint venture, organization, business, individual, municipality, government or any agency or political subdivision thereof, tribal nation, tribe or any other entity.

"Potable Water" shall mean water of a quality meeting, or of a quality higher than, those standards for quality of drinking water established by the CTDPH pursuant to C.G.S. § 19a-36, including R.C.S.A. § 19-13-B102, and as such standards may be revised or amended from time to time.

"Production Points" shall mean those locations in the UConn campus water infrastructure where its wells connect to the water supply and distribution system as indicated on Exhibit A.

"Project" shall mean actions related to securing a long term supply of potable water for purposes of meeting current and future water demand projections for UConn and the Town of Mansfield as described in the ROD.

"Public Authority Commodity Charge Rate" shall mean the PURA-approved commodity charge as specified in CWC's rate schedule to be paid to CWC by public authority customers based on metered water volumes delivered to such customers, or a successor charge established by PURA to replace the use of the Public Authority Commodity Charge Rate.

"PURA" shall mean the Public Utilities Regulatory Authority presently within the CTDEEP, or its successor as established by Law.

"R.C.S.A." shall mean the Regulations of Connecticut State Agencies, and as revised and amended from time to time.

"Reasonable Efforts" shall mean the taking of any and all actions which are commercially reasonable under the circumstances and reasonably required to accomplish the desired task or achieve the desired result.

"Record of Decision" or "ROD" shall mean the Final Record of Decision and Environmental Impact Evaluation (EIE) for Potential Sources of Water Supply, University of Connecticut, Storrs, CT, University Project #901662, dated July 30, 2013.

"Sale of Excess Water Permit" shall mean an authorization issued by CTDPH pursuant to the C.G.S. §22a-358, as amended, as may be required for the purpose of allowing the sale of water between CWC and UConn pursuant to this Agreement.

"State Infrastructure Customer Rate" shall have the meaning set forth in Section 3.1(a) hereof.

"Substantial Completion" shall mean that degree of completion of construction of the Capital Improvements or Campus Connection Spur sufficient to allow for preliminary testing of such infrastructure.

"Supply Source Improvements" shall mean equipment, modifications and all work or actions to be taken by CWC to develop, construct, maintain, treat and repair the supply of Potable Water at Shenipsit Reservoir at sufficient volumes to meet all CWC obligations under this Agreement.

"Term" shall mean the effective period of this Agreement pursuant to Section 11 hereof.

"UConn Customer Rate" shall have the meaning set forth in Section 3.2(a) hereof.

"UConn System" shall mean the water distribution pipes, pumps, tanks and related appurtances located on the UConn campus as detailed on Exhibit A.

"Water Supply Plan" shall mean the water system management documentation prepared by a water company or UConn for purposes of evaluating water supply needs and a strategy to meet such needs as required by C.G.S. §25-32d.

1.2 Adoption of Preamble and Recitals. The Parties each adopt and certify that each of those respective statements concerning such Party as stated in the preamble and recital of this Agreement are true and correct, and are hereby incorporated into the body of this Agreement as though fully set forth in their entirety herein, provided that in cases of conflict, the provisions stated in the body of the Agreement shall control over statements in the preamble and recital.

SECTION 2. WATER SUPPLY

2.1 Water Supply Quantity and Pressure.

(a) Subject to the terms and condition of this Agreement, beginning on the Completion Date and throughout the Term of this Agreement, CWC shall have and agrees to sell and supply to UConn at the Delivery Point on a 24 hour per day and 365 day per year basis all Potable Water demanded by UConn for its own account or for those non-university on-campus users that will remain UConn customers, and CWC shall deliver the estimated volume demanded by off-campus customers and non-university customers at the UConn Technology Park, taking into account the projected water demand time line and average day and peak day volumes presented in Exhibit 2.1, up to the peak day demand volume of 1.5 million gallons per day ("PDDV") and as such Exhibit 2.1 volumes of projected demand may be updated by UConn upon notice to CWC, and as the PDDV may be amended from time to time by mutual agreement of the Parties.

(b) CWC agrees that the quantity of Potable Water to be delivered to UConn during any day, month or year of this Agreement shall be determined in the sole and absolute discretion of UConn but not to exceed the PDDV, subject to the terms and provisions of: i) the Diversion Permit and, ii) Sale of Excess Water Permit, if, upon inquiry of the Parties, CTDPH indicates that such Sale of Excess Water Permit is required for the Project.

(c) CWC agrees that UConn shall not be required to take possession of, or pay for, a minimum quantity of Potable Water during any period of this Agreement.

(d) The Parties acknowledge and agree that the amount of Potable Water to be demanded by UConn under this Agreement may fluctuate from time to time over the Term of the Agreement.

(e) The Parties shall provide Potable Water at the pressure necessary to ensure proper service to UConn and customers to whom CWC connects through the UConn System taking into account the effects of activation of UConn fire suppression systems. UConn shall operate the UConn System in a manner as required to provide adequate pressure at all points at which water leaves the UConn System to serve CWC off-campus customers that exist as of the Completion Date.

(f) In the event that UConn has timely delivered a Deficiency Notice to CWC, the Parties shall diligently confer, review and correct, in a manner reasonably acceptable to the Parties, the circumstances on which the Deficiency Notice is based, and specify the date to be considered the Completion Date.

2.2 Water Supply Quality.

(a) CWC shall supply and deliver Potable Water at the Delivery Point. UConn shall supply and deliver Potable Water at all points at which water leaves the UConn System to serve CWC off-campus customers.

(b) The Parties shall cooperate during the design of the water supply system to be constructed by CWC to identify and select those design elements or equipment reasonably necessary to maintain aesthetic water quality (e.g. color, staining, taste and odor) reasonably acceptable to UConn.

(c) The Parties intend to address the following specified water quality responsibilities as noted below:

(i) CWC shall timely perform, at its sole cost and expense, all requirements for management of disinfection byproducts in that portion of the UConn System in which CWC-supplied water passes including all monitoring, sampling, reporting, treatment, flushing and cleaning required by Law concerning disinfection byproducts. The Parties shall cooperate to equitably allocate the costs of flushing and cleaning the UConn System to the extent that UConn's needs to conduct such tasks in the course of its operations coincide with CWC's obligations in this paragraph. CWC shall ensure that UConn is provided with timely copies of all information secured by CWC, and all filings with CTDPH, in connection with compliance with this provision of the Agreement. CWC shall indemnify, defend and hold harmless UConn for all fines, penalties, and costs of injunctive relief or system treatment, modification and similar costs required to meet disinfection byproduct requirements of Law. The allocation of responsibility established by this section reflects the fact that the UConn System is presently not subject to requirements that will apply when CWC's surface water-supplied system is connected to the UConn System.

(ii) UConn shall be responsible to address, at its sole cost and expense, any exceedence of CTDPH standards for radionuclides and arsenic that occurs at all points at which water leaves the UConn System to serve CWC off-campus customers. The allocation of responsibility established by this section reflects the fact that the CWC water supply to the Project is to be sourced from surface water supplies only and the UConn water is the only groundwater supplied source to the combined UConn and CWC system.

(d) In the event of a water quality concern being identified by either Party with respect to their own water system or the other Party's water system, through testing or otherwise, the following shall apply:

(i) Notice of Water Quality Inquiry. The concerned Party shall notify the other Party and provide all available information regarding the nature of the water quality concern, including test results, expert reports or other documentation.

(ii) Cooperate to Investigate. The Parties agree to cooperate to timely: a) evaluate available information, and b) conduct such additional investigations as required to confirm the nature and cause of the water quality concern.

(iii) Implementation of Remedy. The Parties agree to cooperate to identify and implement a timely and effective remedy to address the cause of any confirmed water quality concern.

(iv) In the event that the delivery of Potable Water by one Party to another causes the receiving Party to incur additional costs for testing, reporting, additional treatment, costs of compliance or fines or penalties, the Party whose water delivery caused the additional costs shall reimburse the other Party to the extent that such additional costs are documented and reasonable.

(e) Subject to Section 2.2(c), responsibility for maintaining the quantity and quality of water as it travels throughout the water supply systems of the Parties shall be as follows:

(i) CWC shall be responsible for ensuring that all water delivered pursuant to this Agreement meets the quality standards for Potable Water when it reaches Meter Pit A;

(ii) UConn shall be responsible for ensuring that all UConn-produced water subject to the terms of this Agreement meets the quality standards for Potable Water at the Production Points and at all points at which water leaves the UConn System to serve CWC off-campus customers; and

(iii) CWC shall be responsible for ensuring that all water delivered to any and all customers by or for the credit of CWC pursuant to this Agreement meets the quality standards for Potable Water when it is received by such customers. The Parties acknowledge and agree that the planned design to incorporate a portion of the UConn campus infrastructure into the distribution system to serve all customers as provided by this Agreement is of value to both UConn and CWC, and the Parties have accordingly so allocated water quality responsibilities hereunder.

SECTION 3. WATER RATES, CHARGES AND CUSTOMERS

3.1 UConn Water Rates and Charges

(a) Upon and after the Completion Date, UConn shall pay CWC for the Net Volume of all Potable Water received by UConn at a purchase price to be known as the "State Infrastructure Customer Rate" ("SICR") that shall be equal to sixty per cent (60%) of: (i) the Public Authority Commodity Charge Rate, and (ii) the Basic Service Charge based on the size of the meter at Meter Pit "A"; each as approved by PURA from time to time.

(b) UConn shall be subject to applicable PURA-approved surcharges or surcredits at the same percentage basis as other customers provided such surcharges or surcredits are applied to bills based on the SICR.

(c) UConn shall not be obligated to pay for water received at the Delivery Point prior to the Completion Date. CWC shall not be obligated to provide UConn with water prior to the Completion Date.

(d) UConn's written acceptance of CWC's written notice of completion of construction and testing of Capital Improvements shall not be unreasonably withheld or delayed.

(e) UConn shall not be obligated to pay for water received by other customers through the UConn water supply infrastructure except for UConn properties as identified on Exhibit 3.1(e).

(f) UConn shall pay the PURA-approved rates and surcharges as provided in this Agreement for only the Net Volume of Potable Water received by UConn. UConn shall not be subject to any form of "take or pay" charges.

(g) The SICR shall apply to: i) all current and future on-campus UConn facilities and UConn affiliates including the University of Connecticut Foundation, University of Connecticut Alumni Association and UConn facilities on the North Campus including the Technology Park, ii) those non-university on-campus customers that will remain customers of UConn except those non-university customers in the Technology Park that shall be billed at the rate charged to New Customers, and iii) those properties that are acquired by UConn after the date of this Agreement that can be served by UConn maintained and operated water system infrastructure. UConn shall timely amend and provide notice to CWC of changes to the list of those water customers entitled to the SICR under this section on Exhibit 3.1(g). Non-university facilities in the Technology Park shall be billed by UConn but charged the CWC rate applicable to New Customers, and UConn shall remit revenues from such facilities to CWC within 30 days of receipt.

(h) Upon UConn's request, and notwithstanding any condition precedent to connection which CWC is otherwise obligated by the Town of Mansfield to satisfy in the case of other non-UConn customers, CWC shall make Reasonable Efforts to connect and supply Potable Water to those off-campus UConn facilities acquired by UConn after the date of this Agreement that do not abut the UConn campus at the time of acquisition, provided, that: i) a water service connection to such facilities is consistent with the state plan of conservation and development prepared pursuant to C.G.S. §16a-24 *et seq.*, and ii) such connection conforms to PURA regulations for the extension of water mains and CWC's PURA approved Main Extension Agreement. Water supplied to such properties by CWC shall be subject to the CWC Public Authority rate and not the SICR.

(i) The Parties acknowledge that the hydraulic characteristics of the connected UConn and CWC water systems is expected to cause variations in the source of water supplied by either Party's system to meet daily water demands. CWC intends to monitor and adjust the water volume supplied to the Delivery Point in a manner estimated to meet the demand of on-campus and off-campus users as required by this Agreement. As noted in the example calculations in Exhibit 3.1(i), there may be occasions when the volume of water contributed by UConn exceeds the CWC-supplied water used by UConn, and in such instances the Parties shall adjust the volume of water thereafter delivered by CWC to replenish the UConn-supplied water rather than require a cash payment from CWC to UConn.

3.2 Non-UConn Rates and Charges

(a) Except for those water users entitled to the SICR under Section 3.1(g), all Billed Customers receiving water supplied by UConn as of the Completion Date ("Existing Customers") shall become direct customers of CWC and shall be charged by CWC at a rate equal to the water commodity charge and basic service charge, each reflected in gallons, as well as the fees and special charges, all as applied by UConn at that time ("Storrs Customer Rate") as currently detailed in Exhibit 3.2(a)(1). Those customers currently supplied by UConn that will receive the Storrs Customer Rate pursuant to this section are identified on Exhibit 3.2(a)(2) and Exhibit 3.2(a)(2) will be amended by UConn to reflect required changes as of the Completion Date. The designation of an Existing Customer shall apply on a site-specific basis.

(b) After the Completion Date, the UConn Customer Rate shall be subject to adjustment by the same dollar amount change approved by PURA for similarly defined categories of customers.

(c) After the Completion Date, all Billed Customers that are not: i) Existing Customers, ii) UConn facilities as of the date of this Agreement, or iii) UConn facilities as noted in Section 3.1(g) hereof, shall be direct customers of CWC and shall be charged by CWC at a rate equal to applicable rates and charges in effect as approved by PURA for similarly defined categories of customers ("New Customers").

3.3 Water Supply Planning and Information Sharing

(a) CWC agrees that neither this Agreement nor any action arising hereunder, including construction of Capital Improvements, other infrastructure development or assignment of water supply customers, shall constitute, or be used by CWC to support, the creation of an Exclusive Service Area assigned to CWC or any Person other than UConn, with respect to UConn's North Campus, Main Campus, East Campus and Depot Campus, and contiguous property thereto acquired by UConn and served by the UConn System after the date of this Agreement as identified on Exhibit 3.3(a); or otherwise provide a basis for CWC to claim an exclusive obligation, right or privilege to provide Potable Water to property or uses of UConn except as provided in this Agreement. UConn shall timely amend and provide notice to CWC of changes to Exhibit 3.3(a).

(b) The Parties agree to cooperate in the timely exchange of reasonably available information including projected water supply and demand data, and related operations information to facilitate required water supply planning efforts of the Parties, to update Exhibit 2.1 as appropriate to reflect changes in current or projected water demands, and to minimize over-estimation or under-estimation of infrastructure capacity needs by either Party. The Parties agree to consult and cooperate with each other to ensure, to the extent reasonably possible, that the CTDPH does not impose duplicative margin of safety volume requirements in the water supply plans of the Parties.

(c) The Parties agree to reasonably cooperate to provide information to facilitate the periodic revision of the other Party's water supply plan, to give timely notice and information concerning anticipated capital projects likely to affect water supply or demand volumes, and to timely provide other information regarding identified changes to the water supply or demand characteristics of either Party's system that may affect the operations that are the subject of this Agreement.

(d) UConn agrees to confer with CWC regarding future on-campus water distribution infrastructure modifications so that the Parties may identify off-campus needs in the town of Mansfield that may be addressed during such modifications in a manner acceptable to UConn in its absolute discretion, and to determine the appropriate sharing of the costs of such modifications.

(e) CWC agrees to timely provide UConn with water use data for all CWC customers in Mansfield for whom UConn provides sewer service. It is the intention of the Parties to maintain the confidentiality of such water use data as required by C.G.S. §16-262c(e), and the Parties agree to cooperate to comply with C.G.S. §16-262c(e) in response to a request for release of protected information.

(f) CWC shall provide UConn with an annual December notice that details the status of Supply Source Improvements and the schedule of measures to be taken by CWC during the following year to ensure that CWC will have a readily available supply of water required for CWC to meet UConn water supply needs taking into account the projected UConn water demand timeline and volumes presented in Exhibit 2.1.

(g) UConn shall provide CWC with an annual December notice that details any anticipated changes to the projected UConn water demand timeline and volumes presented in Exhibit 2.1. for the following year.

SECTION 4. REPRESENTATIONS AND WARRANTIES OF THE PARTIES

4.1 Representations, Warranties and Covenants of the Parties.

Each of the Parties represents and warrants as follows:

(a) Authorization; No Restrictions; Consents or Approvals. Such Party has full power and authority to enter into and perform this Agreement, and all action necessary to authorize the execution and delivery of this Agreement and the performance by such Party of its obligations hereunder has been taken. This Agreement has been duly executed by such Party and constitutes the legal, valid, binding and enforceable obligation of such Party, enforceable against such Party in accordance with its terms subject to bankruptcy laws affecting creditors' rights generally. The execution and delivery of this Agreement and the consummation by such Party of the transactions contemplated herein or hereby, do not: (i) conflict with or violate any of the terms of such Party's charter or by-laws or other constituent documents or governing instruments, or, to such Party's knowledge, any applicable Laws, (ii) conflict with, or result in a breach of any of the terms of, or result in the acceleration of any indebtedness or obligations under, any agreement, obligation or instrument by which such Party is bound or to which any property of such Party is subject, or constitute a default thereunder, or (iii) conflict with, or result in or constitute a default under or breach or violation of or grounds for termination of any Licenses and Permits or other Governmental Approval to which such Party is a party or by which such Party may be bound, or result in the violation by such Party of any Laws to which such Party or any assets of such Party may be subject, except for any such conflict, violation, breach, default or acceleration which would not have a material adverse effect on the ability of the Party to fulfill its obligations under this Agreement or materially and adversely affect the consummation of the transactions contemplated herein.

(b) Technical Knowledge. Such Party has at the time of execution of this Agreement, or will have secured in a manner necessary to timely perform under this Agreement, adequate capacity, technical knowledge and employees to fulfill its obligations under this Agreement.

(c) Title to Assets. Such Party has at the time of execution of this Agreement, or will have secured in a manner necessary to timely perform under this Agreement, sufficient right, title and interest in and to its assets to be able to carry out its obligations under this Agreement. Such Party has not granted any liens, security interests and other encumbrances against its assets, and such assets have or will have as of the Completion Date and during the Term sufficient capacity for such Party to fulfill its obligations under this Agreement.

(d) Licenses and Permits. The execution, delivery and performance of this Agreement and the consummation of the transactions contemplated hereby and thereby will not result in the revocation, cancellation, suspension, modification, or limitation of any of such Party's Licenses and Permits and will not give to any Person any right to revoke, cancel, suspend, modify, or limit any of such Party's Licenses and Permits. Renewal of each of such Party's Licenses and Permits has been or shall be timely applied for to the extent required under all Laws, and to the extent appropriate to protect renewal rights thereunder. To the best of such Party's knowledge, there is no fact or event which is likely to prevent the renewal of any of such Party's Licenses and Permits under existing Laws or which, with the passage of time or the giving of notice or both, is likely to constitute a violation of the terms of any of such Party's Licenses and Permits or of any applications or agreements made in connection therewith. No action or proceeding is pending or, to the best of such Party's knowledge threatened, which could result in the revocation, cancellation, suspension, modification, or limitation of any of such Party's Licenses and Permits.

(e) Compliance with Law. Such Party is presently in compliance with all applicable Laws with respect to matters relevant to the subject of this Agreement, and to the best of such Party's knowledge no event has occurred which would constitute reasonable grounds for a claim that non-compliance has occurred or is occurring.

(f) Restrictions. Such Party will not use or permit any other Person to use its assets, or sell water to any other Person, where such use or sale would prohibit such Party from fulfilling its obligations, covenants and agreements pursuant to the terms of this Agreement. Such Party shall not take any action, or fail to take any action, where such action or failure to act could reasonably be expected to materially impair such Party's ability to fulfill its obligations, covenants, and agreements pursuant to the terms of this Agreement.

(g) Real Estate Interests. Such Party has at the time of execution of this Agreement, or will have secured in a manner necessary to timely perform under this Agreement, and will maintain, protect and defend sufficient right, title and interest in all real estate, easements, rights of way and any other interests in real estate to enable such Party to fulfill its obligations, covenants and agreements pursuant to this Agreement.

(h) Pending Litigation. There are no actions, suits, claims, enforcement actions, or proceedings pending against such Party or any Person by reason of such Person being an official or officer of such Party, whether at law or in equity or before or by any federal, state, municipal or other governmental department, commission, board, bureau, agency or instrumentality which, if adversely determined, would have a material adverse effect on the business, financial position, or results of operations of such Party; nor is there outstanding any writ, order, decree, or injunction applicable to such Party that: (i) calls into question such Party's authority or right to enter into this Agreement and consummate the transactions contemplated hereby, or (ii) would otherwise prevent or delay the transactions contemplated by this Agreement.

4.2 Representations, Warranties and Covenants of CWC. CWC represents and warrants that upon the receipt of required approvals from Governmental Authorities and construction of the Capital Improvements, it shall be ready, willing and able to provide UConn with the water supply service specified in this Agreement, provided that UConn has completed construction of the pipeline between Meter Pit A and the existing UConn System.

SECTION 5. INFRASTRUCTURE DEVELOPMENT

5.1 Construction by CWC. Except as otherwise specifically provided in this Agreement, all matters relating to the design, engineering, permitting, construction, start up, inspection and testing of the Capital Improvements and Supply Source Improvements, including but not limited to the hiring of contractors and engineers, shall be the sole responsibility, cost and expense of CWC. CWC agrees that all Capital Improvements and Supply Source Improvements shall be designed and constructed in compliance with (i) prudent industry practices and (ii) all applicable requirements of Governmental Authorities and Laws, including CTDPH "Guidelines for the Design and Operation of Public Water System Treatment, Works and Sources." CWC agrees that all Capital Improvements shall be designed and constructed in compliance with the environmental mitigation measures and best construction management practices outlined in the ROD.

5.2 Rights of Review and Approval. UConn shall have the right but no obligation to review and approve those aspects of the design, engineering, materials and construction plans and specifications proposed by CWC for the Capital Improvements that relate to the Project design, standards and conditions outlined in the ROD, provided that any such UConn review and approval shall not be unreasonably delayed or withheld, and provided further that UConn will timely advise CWC if UConn intends not to undertake such review and/or such approval process. CWC shall have the right but no obligation to review and provide comments regarding those aspects of the design, engineering, materials and construction plans and specifications proposed by UConn for Meter Pit A and the Campus Connection Spur as they relate to: i) prudent industry practices and, ii) all applicable requirements of Governmental Authorities and Laws, including CTDPH "Guidelines for the Design and Operation of Public Water System Treatment, Works and Sources," provided that any such CWC review and comments shall not be unreasonably delayed or withheld, and provided further that CWC will timely advise UConn if CWC intends not to undertake such review and/or such comment process.

5.3 CWC Contractors and Engineers. CWC shall have responsibility and discretion in the selection of contractors and engineers for the design and construction of the Capital Improvements and Supply Source Improvements provided, however, that CWC shall (i) require any contractors or engineers hired by CWC for such project to agree that the work done and the workmanship, materials and equipment used in the construction of the Capital Improvements and Supply Source Improvements shall be free from defects and shall be constructed in accordance with the plans and specifications for the Capital Improvements and Supply Source Improvements; (ii) require that any such contractors or engineers test the Capital Improvements and Supply Source Improvements for adequacy and proper performance in accordance with such plans and specifications and (iii) require any contractors or engineers to provide CWC with standard certificates of insurance as requested by CWC.

5.4 Construction by UConn. Except as otherwise specifically provided in this Agreement, all matters relating to the design, engineering, permitting, construction, start up, inspection and testing of the Meter Pit A and Campus Connection Spur, including but not limited to the hiring of contractors and engineers, shall be the sole responsibility, cost and expense of UConn. UConn agrees that Meter Pit A and Campus Connection Spur shall be designed and constructed in compliance with (i) prudent industry practices, (ii) the environmental mitigation measures and best construction management practices outlined in the ROD, and (iii) all applicable requirements of Governmental Authorities and Laws, including CTDPH "Guidelines for the Design and Operation of Public Water System Treatment, Works and Sources."

5.5 Infrastructure Development Costs. CWC shall be solely responsible for all fees, costs and expenses related to the performance of its Capital Improvements and Supply Source Improvements obligations under the terms of this Agreement. UConn shall be solely responsible for all fees, costs and expenses related to the performance of its Meter Pit A and Campus Connection Spur obligations under the terms of this Agreement except for the cost of the water meter that will be provided by CWC for Meter Pit A as required by applicable regulations. UConn shall be solely responsible for its own legal and professional costs and expenses related to its opportunity for review of CWC Capital Improvements and Supply Source Improvements obligations under this Section 5. CWC shall be solely responsible for its own legal and professional costs and expenses related to its opportunity for review of UConn Meter Pit A and Campus Connection Spur obligations under this Section 5.

5.6 Easements and Rights of Way. CWC shall be solely responsible, at its cost and expense, for obtaining and maintaining all easements, rights-of-way or other access and entry authorizations required for CWC to perform its Capital Improvements and Supply Source Improvements obligations under this Agreement. UConn shall grant CWC at no cost such easements as are reasonably necessary for CWC to perform its obligations to serve its customers under this Agreement at locations accessed through land owned by UConn.

5.7 Construction Activities, Status, Review and Meetings. UConn shall have the right but no obligation to observe and inspect all construction, start up, inspection and testing activities related to the Capital Improvements and Supply Source Improvements at any reasonable time to confirm CWC's compliance with this Agreement. The Parties agree to establish a mutually acceptable schedule no less frequently than monthly for CWC to present progress reports to UConn. CWC shall reasonably address any good faith comments or concerns presented orally by UConn in the course of UConn observation periods, inspections, and progress report meetings, or in writing from UConn to CWC at any time.

5.8 Infrastructure Expansion.

(a) In the event that CWC proposes to expand the water supply infrastructure to connect with customers or CWC systems outside of the town of Mansfield by means of a connection located downstream of the Delivery Point, such expansion shall be subject to approval by UConn as provided in this Section 5.8.

(b) CWC shall provide UConn with reasonable notice of a proposal to expand the water supply infrastructure to serve customers outside of Mansfield, and provide UConn with sufficient details including the area of proposed service, projected water supply demand, anticipated construction methods, proposed design and specification requirements and construction scheduling including details for any construction proposed for the UConn campus, all as reasonably necessary for UConn to evaluate the proposal.

(c) The Parties: i) shall confer and identify those costs, expenses and operational requirements that may arise with respect to the UConn infrastructure or UConn water uses, ii) shall, at UConn's election, and CWC's sole cost and expense, perform a hydraulic analysis of the requirements of the proposal and impacts to the UConn System, iii) may choose to conduct a cost of service study for the proposed use of the UConn infrastructure (using American Water Works Association or similar generally accepted industry practices for such studies), iv) shall evaluate the potential impact of such extension to UConn with respect to the accounting and responsibility for nonrevenue water in the proposed expanded water supply infrastructure area, and v) shall negotiate in good faith the CWC financial responsibility and operational procedures related to construction and operation of such expansion of infrastructure.

(d) All costs and expenses of design, engineering, permitting and other requirements of Law, construction, and testing of the infrastructure modifications shall be at CWC's sole cost and expense (including CWC's legal fees and costs).

(e) Any proposed expansion of the water supply infrastructure shall: i) be undertaken by CWC in compliance with all Laws, including CEPA if applicable, and ii) shall include best management practices for the minimization of non-revenue water.

(f) UConn's participation, consideration and approval of a proposal to extend the water supply infrastructure shall not be unreasonable withheld or delayed.

(g) In the event that UConn does not approve the extension and the potential customer seeks relief from PURA under C.G.S. §16-20, CWC shall provide timely notice of initiation of such PURA proceeding to the Connecticut Office of Policy and Management, UConn and the Town of Mansfield. CWC shall not construct the extension unless PURA so orders or directs.

SECTION 6. WATER SUPPLY INFRASTRUCTURE OWNERSHIP AND MANAGEMENT

6.1 Transfer of Ownership. The Parties agree that title to off-campus water supply infrastructure presently owned by UConn shall be transferred to and accepted by CWC within thirty days of the date upon which it is fully depreciated by UConn using a sixty year depreciation schedule as set forth on the attached Exhibit 6.1, or shall transfer upon the date of its replacement by CWC, whichever first occurs. Title to off-campus water supply infrastructure owned by UConn that is fully depreciated on or before the Completion Date shall be transferred to CWC within 30 days of the Completion Date.

6.2 License to CWC. UConn shall provide to CWC on the Completion Date an irrevocable license authorizing CWC to use, maintain, repair and replace off-campus water supply infrastructure owned by UConn as required to serve UConn, Existing Customers and New Customers.

6.3 Infrastructure Maintenance. As of the Completion Date and thereafter, CWC shall have responsibility at its sole cost and expense to maintain, repair and replace off-campus water supply infrastructure owned by UConn, in addition to CWC water supply infrastructure, including any UConn infrastructure that has been replaced by CWC. UConn shall have responsibility at its sole cost and expense to maintain, repair and replace on-campus water supply infrastructure, except as otherwise provided in this Agreement with respect to CWC contributions to future improvements of on-campus water supply infrastructure.

6.4 Property Taxes. CWC shall be solely liable for real property, personal property or any other tax with respect to the Capital Improvements and Supply System Improvements constructed by CWC, in addition to those elements of existing UConn water supply infrastructure upon and after the date that title to such UConn water supply infrastructure passes to CWC under the terms of this Agreement.

SECTION 7. INSURANCE, INDEMNIFICATION AND DISPUTE RESOLUTION PROCEDURES

7.1 Insurance. CWC shall carry and maintain at all times during the term of this Agreement, at its sole cost and expense, such insurance as CWC and UConn reasonably agree to be satisfactory to protect both CWC and UConn adequately against any and all loss, damage or liability arising out of or in connection with the transactions contemplated by this Agreement and the development of water supply infrastructure and operation and maintenance of the water supply system. Such insurance policies shall contain such terms, shall be in such form, shall be with such insurers, and shall be for such periods as may be reasonably satisfactory to CWC and UConn, including the following specific provisions: i) Comprehensive General Liability including Premises and Operations, Contractual Liability, Products and Completed Operations on an occurrence basis with a combined limit of at least $1,000,000, and, ii) Umbrella Liability with a limit of $5,000,000 over primary limits for Employer Liability, General Liability and

Automobile Liability. A certificate of insurance reflecting the coverage required herein shall be provided to UConn to confirm the coverage, maintenance and extension of insurance required by this Agreement including a thirty day prior notice of cancellation provision.

7.2 Indemnification. CWC shall indemnify, defend and hold UConn, its trustees, officers, employees and agents harmless from and against all liabilities, damages, losses, penalties, claims, demands, suits and proceedings of any nature whatsoever for personal injury (including death) or property damage of third parties that may arise out of or are in any manner connected with the performance of this Agreement by CWC except to the extent that such injury or damage may be attributable to the negligence or willful action of UConn.

7.3 Informal Resolution of Disputes. The Parties agree that if a dispute arises between the Parties relating to the rights, duties, or obligations arising out of this Agreement, then the Parties shall first meet informally in a good faith effort to negotiate a resolution of the dispute. If the Parties do not resolve a dispute in the informal process described herein, then either Party may propose, and the other Party shall agree, to undertake good faith efforts to settle the dispute by the then current non-administered Mediation Rules of the American Arbitration Association. Nothing in this provision of the Agreement shall affect the participation or intervention rights of UConn under Section 8.2 of this Agreement.

7.4 Claims Procedure. CWC agrees that except as provided in Section 7.3, the sole and exclusive means for the presentation of any claim against the State of Connecticut or UConn arising from this Agreement shall be in accordance with Chapter 53 of the Connecticut General Statutes (Claims Against the State) and CWC further agrees not to initiate any legal proceedings in any state or federal court in addition to, or in lieu of, said Chapter 53 proceedings.

SECTION 8. WATER SUPPLY SOURCE AND PERMITTING

8.1 Water Supply Source. The Parties agree that the source of supply to be used by CWC to fulfill the obligations of this Agreement shall be Shenipsit Lake, it being the intention of the Parties to ensure that CEPA documentation prepared by UConn in support of the Project accurately reflects the water supply source impacts evaluated for the Project. Any change of the supply source identified in the ROD in the application to secure a Diversion Permit for the Project, including modification or renewal thereof, shall be subject to the mutual agreement of the Parties and all applicable requirements of Law.

8.2 Regulatory Permits and Approvals.

(a) Except as otherwise set forth in this Section 8.2, CWC shall be solely responsible for securing all Licenses and Permits or other Governmental Approvals, including modifications or renewals thereof, necessary or appropriate to construct or operate infrastructure or equipment to supply and deliver Potable Water to the Delivery Point or otherwise necessary for CWC to perform its obligations under this Agreement including PURA approval of water rates as set forth in this Agreement.

(b) The Parties shall timely confer and mutually determine the appropriate Party or Parties to act as applicants or permittees for the Diversion Permit, other Licenses and Permits and other Governmental Approvals, including modifications or renewals thereof, as necessary or appropriate to fulfill the obligations and purposes of this Agreement.

(c) The Parties agree to cooperate and use Reasonable Efforts to secure the Diversion Permit, other Licenses and Permits and other Governmental Approvals, including modifications or renewals thereof, necessary or appropriate to fulfill the obligations and purposes of this Agreement.

(d) UConn shall have a right, but not an obligation, to review and approve of all application materials, reports, testimony or documentation to be submitted by CWC in support of any application for the Diversion Permit, other Licenses and Permits and other Governmental Approvals, or modifications or renewals thereof, necessary or appropriate to fulfill the obligations or purposes of this Agreement, and any declaratory action initiated or defended by CWC before a state agency or any court proceeding initiated or defended by CWC related to the subject of this Agreement. UConn shall not unreasonably withhold or delay its review and approval under this provision of the Agreement, and UConn shall timely advise CWC if it intends not to undertake such review.

(e) UConn shall have a right, but not an obligation except upon its being a necessary party under the requirements of applicable Law, to participate as a co-applicant or become a co-permittee with CWC in any application for or receipt of the Diversion Permit, Licenses and Permits or other Governmental Approvals, including modifications or renewals thereof, necessary or appropriate to fulfill the obligations or purposes of this Agreement, and any declaratory action initiated or defended by CWC before a state agency or any court proceeding initiated or defended by CWC related to the subject of this Agreement. Independent of its right to act as a co-applicant, and subject to the requirements of applicable Law, UConn shall have a right to intervene in any application by CWC for the Diversion Permit, Licenses and Permits, and Governmental Approvals necessary or appropriate to fulfill the obligations or purposes of this Agreement, and any declaratory action initiated or defended by CWC before a state agency or any court proceeding initiated or defended by CWC related to the subject of this Agreement.

(f) CWC shall be solely responsible for legal, engineering, and consulting and expert witness costs, administrative fees and other expenses arising in connection with CWC efforts to secure the Diversion Permit, Licenses and Permits or Governmental Approvals, including modifications or renewals thereof, and all other state agency proceedings and court proceedings related to the matters that are the subject of this Agreement or CWC's efforts to perform its obligations under this Agreement. UConn shall have no responsibilities or cost obligations in connection with such efforts, proceedings or matters except for UConn's own legal and other professional costs and expenses.

(g) Notwithstanding the identification of UConn as a co-applicant or co-permittee in Diversion Permit, Licenses and Permits or other Governmental Approvals, CWC (i) shall be solely responsible for compliance with such permit, license or approval at its sole cost and expense, (ii) shall have sole liability for all costs, expenses (including legal fees and costs), fines, penalties, and costs of compliance related to a remedy for any violation of such permit, license or approval or enforcement action by Governmental Authorities with respect thereto, and (iii) shall indemnify and hold harmless UConn with respect to all liabilities arising from UConn's position as a co-applicant or co-permittee except as such compliance, liability or indemnification relates to any obligations to comply with conditions of permits that are specifically required of UConn. UConn (i) shall be solely responsible for compliance with the water diversion registrations held by UConn pursuant to C.G.S. §22a-368 and the Water Diversion Policy Act, and operation of the UConn System, except as otherwise provided in this Agreement, at its sole cost and expense, and (ii) shall have sole liability for all costs, expenses (including legal fees and costs), fines, penalties, and costs of compliance related to a remedy for any violation of such registrations or enforcement action by Governmental Authorities with respect thereto. Each Party agrees to make all reasonable efforts to provide the other Party with notice upon receipt or within two business days of receipt of any notice of violation, order, judicial enforcement action or compliance inquiry from a Governmental Authority, or any third party notice of claim, notice of violation or litigation concerning water supply infrastructure, sources of water supply or operations related to the water systems that are the subject of this Agreement.

SECTION 9. SYSTEM OPERATIONS AND MANAGEMENT

9.1 Connection Restrictions. CWC shall not permit customer connections to the Capital Improvements that would violate any connection restriction set forth in the ROD except as ordered or directed by PURA pursuant to C.G.S. §16-20 and with timely notice of initiation of such PURA proceeding being given by CWC to the Connecticut Office of Policy and Management, UConn and the Town of Mansfield.

9.2 UConn Well System Operations. CWC agrees that UConn shall retain the absolute right to operate a water supply well system that may divert water up to the withdrawal volumes currently authorized by UConn water diversion registrations filed with the CTDEEP. UConn shall continue to operate such water diversions in a manner consistent with its diversion registrations, subject to conditions or requirements that may be imposed by CTDEEP or CTDPH, unless UConn requests an increase in water supplied by CWC and CWC agrees to provide additional water. Subject to the obligations of CWC under this Agreement, UConn shall continue to operate the UConn System in compliance with Law. Nothing in this Agreement or otherwise shall modify or infringe upon UConn's ability to maintain existing measures or establish new measures to conserve or reuse water to meet UConn supply requirements and conservation objectives.

9.3 [Intentionally Omitted.]

9.4 Billing.

(a) CWC billing procedures shall conform to the CWC Regulations, as approved by PURA, except as otherwise specified by this Agreement.

(b) The Customer as defined by CWC Regulations shall mean the Billing Customer as specified by this Agreement.

(c) Lost and unaccounted for water ("non-revenue water") shall be billed in accordance with the terms of this Agreement.

9.5 Freedom of Information Act Requirements. CWC agrees to cooperate with UConn as reasonably required for UConn to comply with applicable standards and procedures of the Freedom of Information Act with respect to UConn information that may be created or maintained under the terms of this Agreement that may constitute a "record" as defined by FOIA. CWC and UConn agree that CWC is not a Public Agency, as defined by FOIA, and nothing in this Agreement is intended to cause CWC to function as a Public Agency.

9.6 Other CWC Obligations and Related Matters. CWC shall not allow its performance under the terms and conditions of this Agreement, or UConn's exercise of its rights under this Agreement, to be subject to the control, prior-review or approval of any Persons not a party to this Agreement except as specifically required by statute or regulations of the State of Connecticut. Nothing in this Agreement shall limit the ability of UConn to accept an invitation to participate in a water advisory committee or similar group established by CWC and the town of Mansfield or other Persons with respect to water management activities in a geographic area affecting UConn property or interests.

9.7 Operational Coordination, Notices, and Emergency Procedures. The Parties shall cooperate to timely prepare, and revise and amend as appropriate, a document that details practices and procedures to be used by the Parties to implement the operations that are the subject of this Agreement including communications practices (including Force Majeure communications), emergency procedures, effective operational notice methods between the Parties or to others, water quality assurance practices, mutual assistance practices and other practices or procedures as the Parties may determine to be of mutual value or reasonable necessity.

SECTION 10. TAXES. CWC shall pay any and all taxes, federal, state, or local, in the nature of income, sales, use, transfer gains, conveyance, recordings, ad valorem, stamp, transfer and any similar tax, fee or duty required to be paid in respect of CWC's performance, or the transfer of UConn infrastructure to CWC, under this Agreement.

SECTION 11. TERM, TERMINATION MATTERS AND MILESTONE DATES

11.1 Term of Agreement and Termination Matters.

(a) The initial term of this Agreement (the "Initial Term") shall be for the period commencing on the date hereof and continuing for at least forty-seven years (reflecting the current UCONN water supply planning period) unless otherwise terminated or extended pursuant to this Agreement.

(b) The Initial Term and extensions thereof are subject to earlier termination upon the event of a failure to secure and maintain in full force and effect all those Governmental Approvals required by Law to fulfill the purposes and requirements of this Agreement including:

i) the Diversion Permit and, ii) Sale of Excess Water Permit, if, upon inquiry of the Parties, CTDPH indicates that such permit is required for the Project.

(c) The Parties acknowledge that it is the intent of the Parties, subject to applicable Law, including the renewal or extension of Governmental Approvals required by Law to fulfill the purposes and requirements of this Agreement, that the Term of this Agreement should be renewed in seven year renewal periods after the Initial Term (such Initial Term and subsequent renewals or extensions being referred to herein as the "Term").

11.2 Termination and Infrastructure Matters. In recognition that elements of the CWC and UConn water infrastructure will be fully integrated and will serve both UConn and off-campus customers in the town of Mansfield, any termination of this Agreement by UConn, other than as a result of the lack of a required Governmental Authorization that is the obligation of CWC to secure and maintain, shall only terminate UConn's access to and purchase of Potable Water from CWC. Upon such termination by UConn, title to any off-campus infrastructure then owned by UConn that has not been fully depreciated and is reasonably necessary for CWC to serve off-campus customers in the town of Mansfield shall be transferred to CWC upon payment to UConn of the undepreciated book value of such assets. Furthermore, upon such termination by UConn, CWC shall be allowed to continue to use the elements of on-campus water distribution infrastructure then in use by CWC and reasonably necessary for CWC to continue to transfer Potable Water to meet the needs of customers in the town of Mansfield or such additional customers as may be authorized by UConn pursuant to this Agreement, provided that CWC shall pay UConn a negotiated share of the costs of operation, maintenance, repair and replacement costs of such UConn water infrastructure.

11.3 Milestone Dates

(a) CWC shall perform its obligations in conformance with the following schedule:

(i) No later than February 15, 2014, CWC shall deliver to UConn the drafts of all applications and supporting information required to secure the Diversion Permit for the Project including such information relating to Construction Improvements and Supply Source Improvements as may be required by CTDEEP for the Diversion Permit application.

(ii) No later than 30 days after UConn has completed its review, CWC shall file complete applications, fees and supporting information with the CTDEEP for the Diversion Permit for the Project provided that if UConn is to be a co-applicant UConn has executed application documents as required by CTDEEP regulations.

(iii) No later than September 1, 2014, CWC shall deliver to UConn the preliminary engineering design plans for the Capital Improvements.

(iv) No later than January 1, 2015, CWC shall deliver to UConn the drafts of all applications and supporting information required to secure Licenses and Permits and other Governmental Approvals for the Capital Improvements.

(v) No later than 18 months after receipt of required Licenses and Permits and other Governmental Approvals, CWC shall: i) achieve Substantial Completion of the Capital Improvements, and ii) provide UConn with CWC's punch list of remaining tasks to complete the construction and testing tasks for the Capital Improvements ("C&I Tasks") including an implementation schedule for the C&I Tasks.

(vi) No later than 60 days following Substantial Completion of construction CWC shall complete construction and testing of Capital Improvements. UConn shall deem this to be the project Completion Date unless UConn identifies within 60 days that there are items that are not completed in accordance with the terms of this Agreement or the terms of any Licenses or Permits.

(vii) No later than November 1, 2014, CWC shall file complete applications, fees and supporting information to CTDPH for a Sale of Excess Water Permit, if CTDPH has indicated that such a permit is required for the Project.

(viii) No later than June 1, 2014, CWC shall provide UConn with the schedule for planned improvements and capital investments for the construction of the expanded treatment capacity for its Western System that will be available to meet the projected water supply needs identified in the CWC Water Supply Plan, including those of UConn outlined in Exhibit 2.1.

(ix) To the extent consistent with annual forecasted usage data provided by UConn to ensure updated demand projections, CWC shall complete construction and testing of all Supply Source Improvements no later than six months before the date that the total volume of water required to meet the average daily demand of UConn and other customers in Mansfield is estimated by CWC to meet or exceed one million gallons per day.

(b) Each of the Parties shall perform any review they elect to conduct with respect to the other Party's proposed designs, plans, specifications, applications for the Diversion Permit, Licenses and Permits and other Governmental Approvals, as applicable, in a commercially reasonable and timely manner.

(c) UConn shall perform its obligations in conformance with the following schedule:

(i) No later than September 1, 2014, UConn shall deliver to CWC preliminary engineering and design plans for Meter Pit A and the Campus Connection Spur;

(ii) No later than 18 months after CWC's receipt of required Licenses and Permits and other Governmental Approvals as noted above, UConn shall: 1) achieve Substantial Completion of Meter Pit A and the Campus Connection Spur, and 2) provide CWC with UConn's punch list of remaining tasks to complete the construction and testing tasks for Meter Pit A and the Campus Connection Spur ("MP/CCI Tasks") including an implementation schedule for the MP/CCI Tasks; and

(iii) No later than sixty days following the date of 11.3(c)(ii), above, UConn shall complete construction and testing of Meter Pit A and the Campus Connection Spur.

(d) A Milestone Date shall be extended by a period of time equal to the pendency of any administrative or judicial appeal, or action for or order of injunction, concerning the task to be performed by such Milestone Date. Subsequent Milestone Dates shall be extended, as reasonably necessary, to reflect the period of delay related to such appeals or injunctions, taking into account the ability of the Parties to reasonably continue their efforts towards completing subsequent tasks during the pendency of any such appeals, actions or injunctions. Milestone Dates shall also be extended based on the mutual agreement of the Parties in recognition of one or more factors that were not reasonably foreseeable as of the effective date of this Agreement.

SECTION 12. NON-DISCRIMINATION AND POLITICAL CONTRIBUTIONS

12.1 State Contract Non-Discrimination Requirements.

(a) For purposes of this Section, the following terms are defined as follows:

(i) "Commission" means the Commission on Human Rights and Opportunities;

(ii) "agreement" or "contract" includes any extension or modification of the agreement or contract;

(iii) "CWC" includes any successors or assigns of CWC;

(iv) "gender identity or expression" means a person's gender-related identity, appearance or behavior, whether or not that gender-related identity, appearance or behavior is different from that traditionally associated with the person's physiology or assigned sex at birth, which gender-related identity can be shown by providing evidence including, but not limited to, medical history, care or treatment of the gender-related identity, consistent and uniform assertion of the gender-related identity or any other evidence that the gender-related identity is sincerely held, part of a person's core identity or not being asserted for an improper purpose;

(v) "marital status" means being single, married as recognized by the State of Connecticut, widowed, separated or divorced; and

(vi) "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders.

For purposes of this Section, the terms "agreement" or "contract" do not include an agreement or contract where each party is (1) a political subdivision of the state, including, but not limited to, a municipality, (2) a quasi-public agency, as defined in Conn. Gen. Stat. Section 1-120, (3) any other state, including but not limited to any federally recognized Indian tribal governments, as defined in Conn. Gen. Stat. Section 1-267, (4) the federal government, (5) a foreign government, or (6) an agency of a subdivision, agency, state or government described in the immediately preceding enumerated items (1), (2), (3), (4) or (5).

(b) (1) CWC agrees and warrants that in the performance of this Agreement CWC will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, mental retardation, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by CWC that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut; and CWC further agrees to take affirmative action to insure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, mental retardation, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by CWC that such disability prevents performance of the work involved; (2) CWC agrees, in all solicitations or advertisements for employees placed by or on behalf of CWC, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission; (3) CWC agrees to provide each labor union or representative of workers with which CWC has a collective bargaining agreement or other agreement or understanding and each vendor with which CWC has an agreement, contract or understanding, a notice to be provided by the Commission, advising the labor union or workers' representative of CWC's commitments under this section and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) CWC agrees to comply with each provision of this Section and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes § 46a-56; and (5) CWC agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of CWC as relate to the provisions of this Section and Connecticut General Statutes § 46a-56.

(c) CWC shall include the provisions of subsection (b) of this Section in every sub-contract or purchase order entered into in order to fulfill any obligation of an agreement with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. CWC shall take such action with respect to any such sub-contract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes §46a-56; provided if CWC becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, CWC may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.

(d) CWC agrees to comply with the regulations referred to in this Section as they exist on the date of this Agreement and as they may be adopted or amended from time to time during the term of this Agreement and any amendments thereto.

(e) (1) CWC agrees and warrants that in the performance of the Agreement CWC will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or the State of Connecticut, and that employees are treated when employed without regard to their sexual orientation; (2) CWC agrees to provide each labor union or representative of workers with which CWC has a collective bargaining Agreement or other contract or understanding and each vendor with which CWC has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of CWC's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (3) CWC agrees to comply with each provision of this section and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes § 46a-56; and (4) CWC agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of CWC which relate to the provisions of this Section and Connecticut General Statutes § 46a-56.

(f) CWC shall include the provisions of the foregoing paragraph in every sub-contract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. CWC shall take such action with respect to any such sub-contract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes § 46a-56; provided, if CWC becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, CWC may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.

12.2 Political Contributions. This Agreement is subject to the requirements of C.G.S. §9-612 and CWC shall comply with C.G.S. §9-612 including those restrictions prohibiting state contractors, and principals of a state contractor from making a contribution to: (i) an exploratory committee or a candidate committees established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contribution or expenditures to or for the benefit of such candidates, or (iii) a party committee. CWC agrees that it shall not knowingly solicit contributions from the state contractor's or prospective state contractor's employees or from a subcontractor or principals of the subcontractor on behalf of: (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

CWC shall advise all those employees, officers or directors of CWC who given their position and this Agreement are "principles of a state contractor", as defined in C.G.S. §9-612, of the requirements applicable to them pursuant to C.G.S. §9-612.

12.3 State Contract Executive Orders. This Agreement is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings, and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, which orders are hereby incorporated herein by reference.

SECTION 13. FORCE MAJEURE EVENT AND SPECIAL NOTICE

13.1 Force Majeure Event. If any Party is prevented from performing any of its obligations hereunder, for reasons beyond its reasonable control, including, but not limited to, the shortage (whether actual or threatened) of, or the failure of common carriers, suppliers or subcontractors to deliver, necessary raw materials or supplies; embargoes, epidemics, quarantines; unusually severe weather conditions; fires, explosions, floods or other acts of God or the elements; water main breaks; acts of terrorism, war (declared or undeclared) or of a public enemy or other acts of hostility; civil disturbances, insurrections, riots or labor unrest; the threat or actual existence of a condition that may affect the integrity of the supply of any service; the necessity of making repairs to or reconditioning or periodic flushing or cleaning wells, pipelines, transmission lines and other equipment; or the legal requirement or order of any Governmental Authority; provided, however, that any Party subject to the legal requirement or order of any Governmental Authority shall use Reasonable Efforts to defend and take all appeals in opposition to such actions (each of the foregoing, a "Force Majeure Event"), such non-performing party shall not be liable for breach of this Agreement with respect to such non-performance to the extent any such non-performance is due to a Force Majeure Event. Such non-performing party shall exercise all Reasonable Efforts to eliminate the Force Majeure Event and to resume performance of its obligations as soon as practicable.

13.2 Special Notice. Upon the occurrence of a Force Majeure Event, the Party prevented from performing its obligations hereunder shall contact the other Party by telephone as soon as practicable with information available at that time so that the Parties may identify timely and mutually acceptable measures that may be taken to mitigate the effects of the Force Majeure Event. For purposes of this section, the Parties will provide telephone contact information to each other and ensure that such information is kept current and maintained in the documentation referenced in Section 9.7 hereof. Any further notices of a less time-sensitive nature shall be delivered as provided by Section 14.1 hereof.

SECTION 14. GENERAL PROVISIONS

14.1 Notice. Except as provided in Section 5.6 and Section 13.2, any notice, report, demand, waiver, consent or other communication given by a Party under this Agreement (each a "notice") shall be in writing, may be given by a Party or its legal counsel, and shall deemed to be duly given: (i) when personally delivered, or (ii) upon delivery by United States Express Mail or similar overnight courier service which provides evidence of delivery, or (iii) when five days have elapsed after its transmittal by registered or certified mail, postage prepaid, return receipt requested, addressed to the Party to whom directed at that Party's address as it appears below or another address of which that Party has given notice, or (iv) when delivered by facsimile transmission if a copy thereof is also delivered in person or by overnight courier within two days of such facsimile transmission. Notices of address change shall be effective only upon compliance with the provisions of the foregoing sentence.

Notice to UCONN shall be sufficient if given to:

University of Connecticut
Gulley Hall, Storrs Campus
352 Mansfield Rd.
Storrs, CT 06269
Attn: Executive Vice President & Chief Financial Officer

Notice to CWC shall be sufficient if given to:

Connecticut Water Company
93 West Main Street
Clinton, CT 06413
Attn: President

The Parties shall have the right from time to time and at any time to change their respective addresses and each shall have the right to specify as its address any other address by at least fifteen (15) days written notice to the other Party hereto.

14.2 Entire Agreement. This Agreement, including the schedules and exhibits hereto, constitutes the entire agreement between the Parties pertaining to its subject matter, and it supersedes any and all written or oral agreements previously existing between the Parties with respect to such subject matter.

14.3 Amendment and Modification. No amendment or modification of any provision of this Agreement shall be valid unless the same shall be in writing and signed by both Parties.

14.4 Waiver. Any Party's failure to insist on strict performance of any provision of this Agreement shall not be deemed a waiver of any of its rights or remedies, nor shall it relieve any other Party from performing any subsequent obligation strictly in accordance with the terms of this Agreement. No waiver shall be effective unless it is in writing and signed by the Party against whom enforcement is sought. Such waiver shall be limited to provisions of this Agreement specifically referred to therein and shall not be deemed a waiver of any other provision. No waiver shall constitute a continuing waiver unless the writing states otherwise.

14.5 Governing Law. This Agreement and matters arising out of or related to this Agreement (including tort claims) shall be construed in accordance with and governed by the laws of the State of Connecticut without giving effect to the conflict of laws principles thereof.

14.6 Severability. If any term or provision of this Agreement shall be held to be invalid or unenforceable for any reason, such term or provision shall be ineffective to the extent of such invalidity or unenforceability without invalidating the remaining terms and provisions hereof, and this Agreement shall be construed as if such invalid or unenforceable term or provisions had not been contained herein.

14.7 Relationship between the Parties. Neither of the Parties and none of the agents, employees, representatives, or independent contractors of either Party shall (i) be considered an agent, employee or representative of the other Party for any purpose whatsoever; (ii) have any authority to make any agreement or commitment for the other Party or to incur any liability or obligation in the other Party's name or on its behalf; or (iii) represent to any other Person that it has any right so to bind the other Party hereto. Nothing contained in this Agreement shall be construed or interpreted as creating an agency, partnership, or joint venture relationship between the Parties.

14.8 Parties in Interest. Except as specifically contemplated hereby, nothing in this Agreement is intended to confer any benefits, rights or remedies on any Persons other than the Parties. This Agreement shall not be construed to relieve or discharge any obligations or liabilities of third persons, nor shall it be construed to give third persons any right of subrogation or action over or against any Party. Nothing in this Agreement creates an obligation or liability of UConn to supply or deliver water to third parties.

14.9 Assignment; Successors and Assigns. This Agreement may not be assigned by CWC without the prior written consent of UConn. This Agreement shall not inure to the benefit of any CWC successor without the prior written consent of UConn.

14.10 Interpretation. For purposes of interpretation of this Agreement, the Parties agree that neither party shall be deemed to have been the drafter of the Agreement. The Parties further acknowledge that this Agreement has been arrived at through negotiation, and that each Party has been represented by legal counsel and has had a full and fair opportunity to revise the terms of this Agreement.

14.11 Miscellaneous. The Section headings of this Agreement are for convenience of reference only and do not form a part hereof and do not in any way modify, interpret, or construe the intentions of the Parties. This Agreement may be executed in two or more counterparts and all such counterparts shall constitute one and the same instrument. Delivery of an executed signature page to this Agreement by facsimile transmission or electronic mail attachment shall be as effective as delivery of a manually signed counterpart of this Agreement. The term "including" is by way of example and not limitation.

[THE NEXT PAGE IS THE SIGNATURE PAGE]

IN WITNESS of the foregoing, the Parties have executed this Agreement by their duly authorized officers as of the date first set forth above.

THE UNIVERSITY OF CONNECTICUT

By:______________________________

Name: Richard Gray

Title: Executive Vice President for Administration & Chief Financial Officer

CONNECTICUT WATER COMPANY

By:______________________________

Name: Eric W. Thornburg

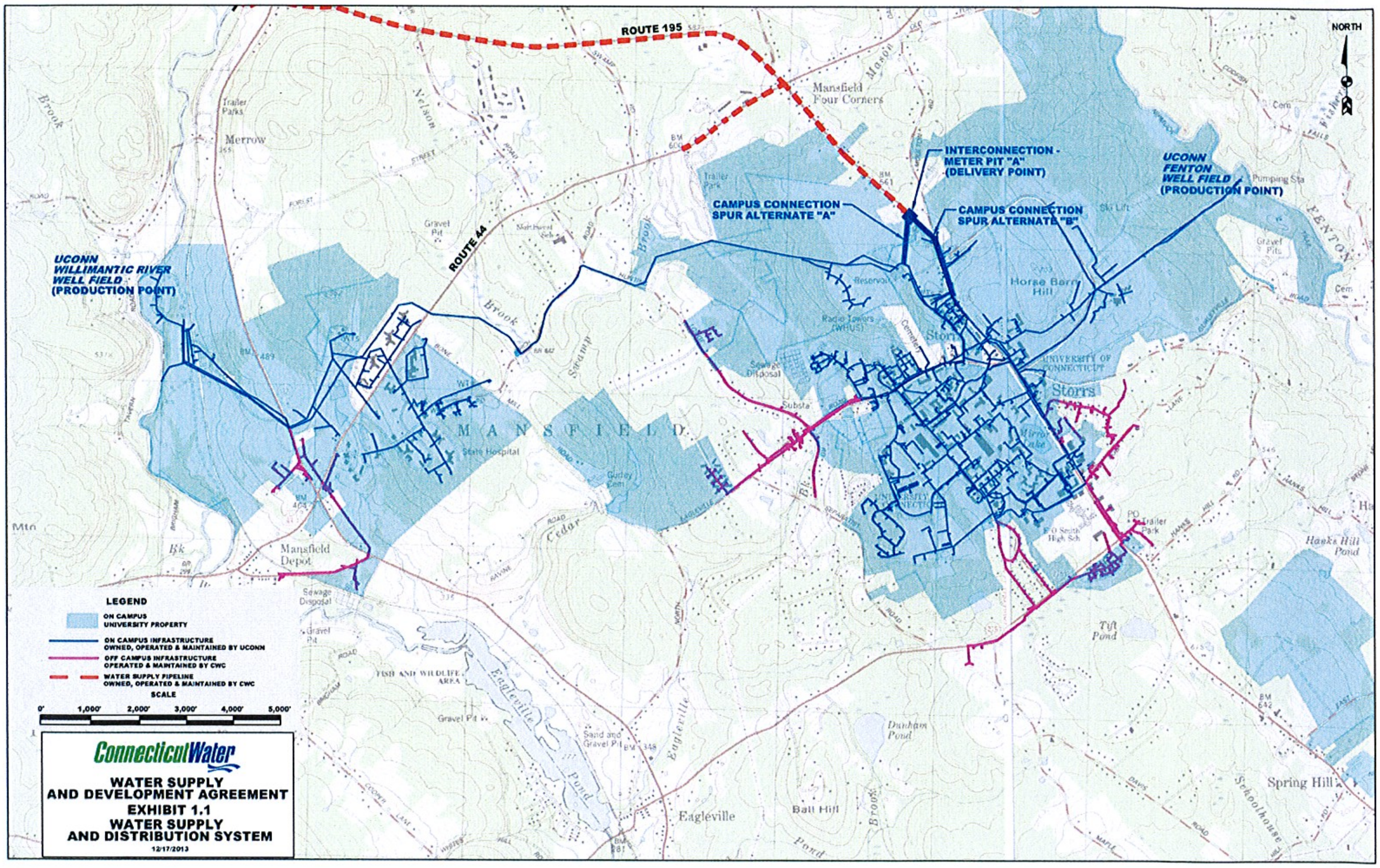
Title: President & CEO

List of Exhibits

Exhibit A

Project Infrastructure Plan

Exhibit A.1.1: Water Supply and Distribution System (12/17/2013)
Exhibit A.1.2: Capital Improvements (12/17/2013)


ROUTE 195
NORTH
INTERCONNECTION - METER PIT "A" (DELIVERY POINT)
UCONN FENTON WELL FIELD (PRODUCTION POINT)
CAMPUS CONNECTION SPUR ALTERNATE "A"
CAMPUS CONNECTION SPUR ALTERNATE "B"
UCONN WILLIMANTIC RIVER WELL FIELD (PRODUCTION POINT)
ROUTE 44
Mansfield Four Corners
Merrow
Horse Barn Hill
UNIVERSITY OF CONNECTICUT
Storrs
MANSFIELD
State Hospital
Mansfield Depot
Eagleville
Spring Hill
Hanks Hill Pond
Tift Pond
Dunham Pond
Ball Hill
FISH AND WILDLIFE AREA
LEGEND
ON CAMPUS UNIVERSITY PROPERTY
ON CAMPUS INFRASTRUCTURE OWNED, OPERATED & MAINTAINED BY UCONN
OFF CAMPUS INFRASTRUCTURE OPERATED & MAINTAINED BY CWC
WATER SUPPLY PIPELINE OWNED, OPERATED & MAINTAINED BY CWC
SCALE
0' 1,000' 2,000' 3,000' 4,000' 5,000'
ConnecticutWater
WATER SUPPLY
AND DEVELOPMENT AGREEMENT
EXHIBIT 1.1
WATER SUPPLY
AND DISTRIBUTION SYSTEM
12/17/2013

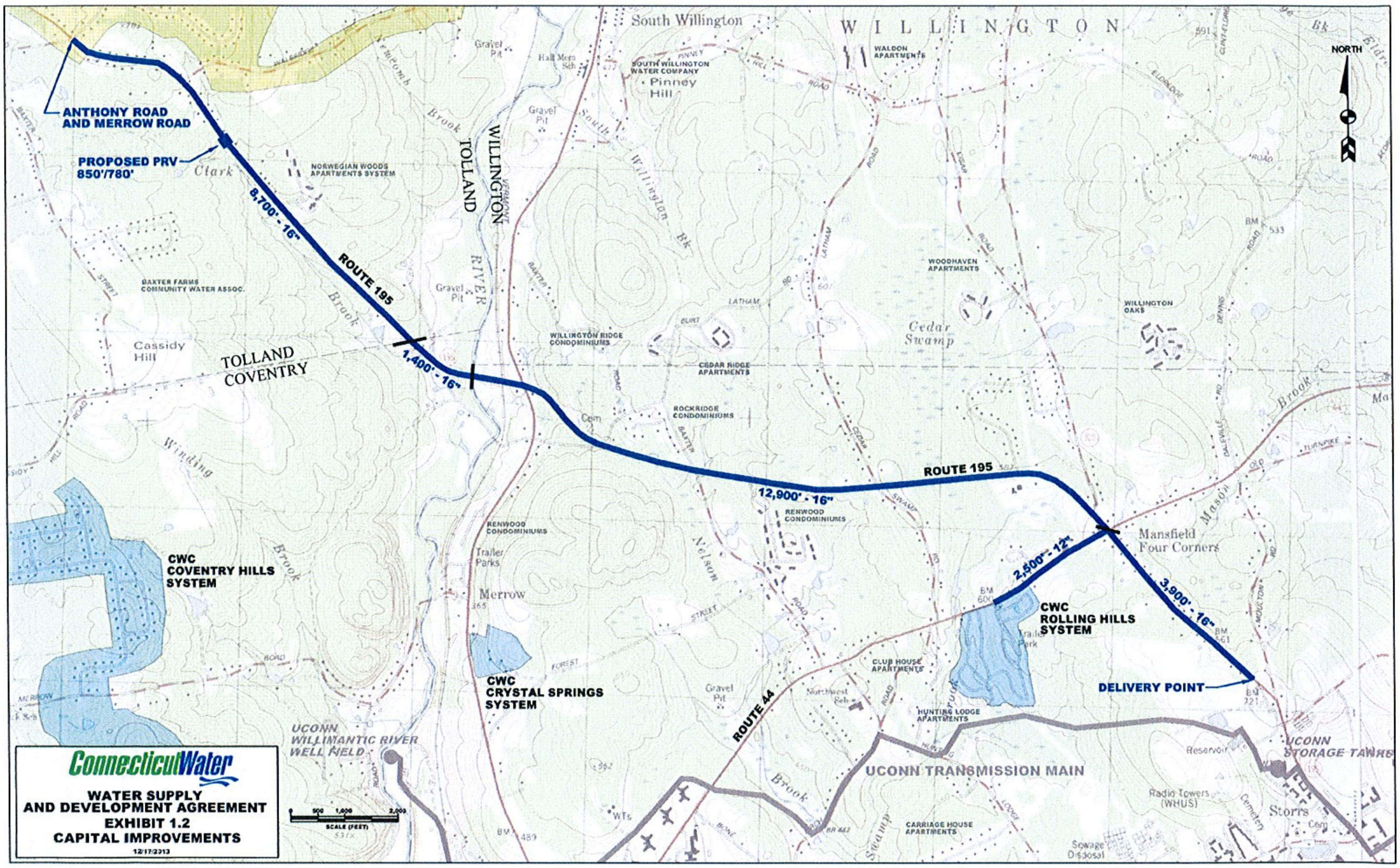

ANTHONY ROAD AND MERROW ROAD
PROPOSED PRV 850'/780'
8,700' - 16"
ROUTE 195
1,400' - 16"
12,900' - 16"
ROUTE 195
2,500' - 12"
3,900' - 16"
DELIVERY POINT
CWC ROLLING HILLS SYSTEM
CWC COVENTRY HILLS SYSTEM
CWC CRYSTAL SPRINGS SYSTEM
UCONN WILLIMANTIC RIVER WELL FIELD
UCONN TRANSMISSION MAIN
UCONN STORAGE TANKS
ROUTE 44
TOLLAND
COVENTRY
WILLINGTON
South Willington
Mansfield Four Corners
Storrs
Merrow
Cassidy Hill
Pinney Hill
Cedar Swamp
SOUTH WILLINGTON WATER COMPANY
NORWEGIAN WOODS APARTMENTS SYSTEM
BAXTER FARMS COMMUNITY WATER ASSOC.
WALDON APARTMENTS
WOODHAVEN APARTMENTS
WILLINGTON OAKS
WILLINGTON RIDGE CONDOMINIUMS
CEDAR RIDGE APARTMENTS
ROCKRIDGE CONDOMINIUMS
RENWOOD CONDOMINIUMS
CLUB HOUSE APARTMENTS
HUNTING LODGE APARTMENTS
CARRIAGE HOUSE APARTMENTS
NORTH
ConnecticutWater
WATER SUPPLY AND DEVELOPMENT AGREEMENT
EXHIBIT 1.2
CAPITAL IMPROVEMENTS
12/17/2013

Exhibit 2.1

Project Water Demand Projections

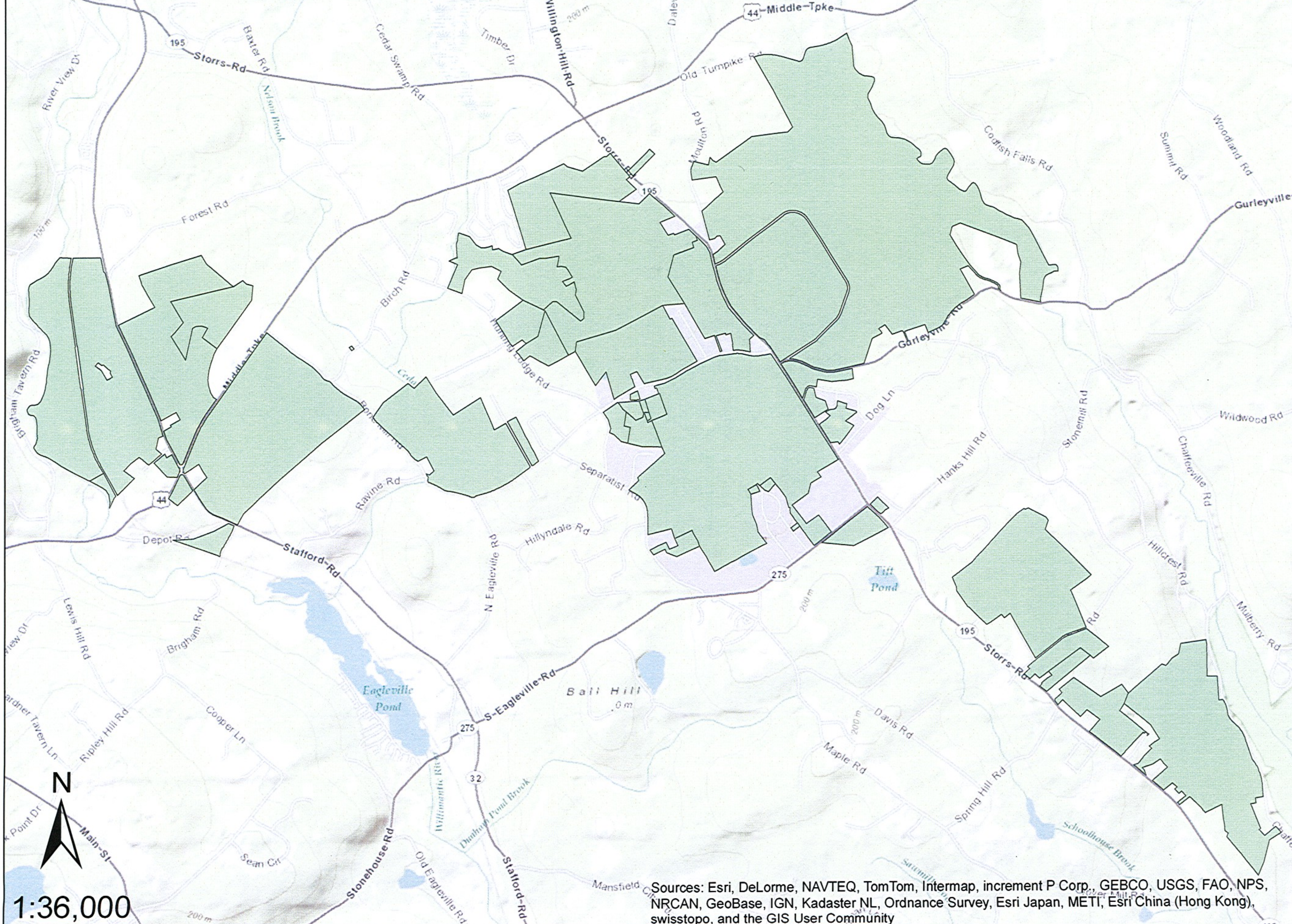
Exhibit 2.1
Project Water Demand Projections

	Additional Average Day Demand				
	Tech Park	Off-Campus	NextGen	Margin of Safety	TOTAL
2015	0	0	24,125	0	0
2030	126,480	242,000	138,500	369,953	876,933
2045	333,900	369,000	138,500	420,116	1,261,516
2060	333,900	453,500	138,500	459,385	1,385,285
	Additional Peak Day Demand				
2015	0	0	43,425	420,691	464,116
2030	168,219	321,860	239,700	808,965	1,538,744
2045	444,087	490,770	239,700	875,682	2,050,239
2060	444,087	603,155	239,700	914,041	2,200,983

Exhibit 3.1(e)

UConn Properties

Exhibit 3.1(e) - UConn Properties



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Exhibit 3.1(g)

Non-University On-Campus SICR Water Customers

EXHIBIT 3-1(g)
Non-University On-Campus SICR Water Customers (2013)

Customer Name	Street Number	Street Name
Uconn Alumni Association	2348	Alumni Drive
Uconn Foundation	2390	Alumni Drive
Nathan Hale Inn	855	Bolton Road
Uconn Department of Residential Life	41	Horsbarn Hill Rd
Uconn Department of Residential Life	42	Horsbarn Hill Rd
Uconn Department of Residential Life	43	Horsbarn Hill Rd
CT Dept of Corrections Bergin Correctional Institution	251	Middle Tnpk
TRI- County ARC Inc	290	Middle Tnpk
Islamic Center of the University of Connecticut	28	N Eagleville Rd
St. Marks Episcopal Church	42	N Eagleville Rd
St Thomas Aquinas	46	N Eagleville Rd
Hillel	54	N Eagleville Rd
Private Residence	64	Spring Manor Ln
Private Residence	66	Spring Manor Ln
Uconn Department of Residential Life	86	Spring Manor Ln
Uconn Department of Residential Life	104	Spring Manor Ln
AT&T Services Inc	1298	Storrs Road
Uconn Dept of Student Activites - Depot Campus athletic field		Weaver Road

Exhibit 3.1(i)

Example Calculation of Net Volume

Exhibit 3.1(i) Example Calculation of Net Volume

***Example #1** – CWC net usage is less than what is delivered:*

(1) Water delivered at CWC Production Point		500,000 gallons	
(2) Total Volume of Water Received by CWC			
a) Metered off campus usage	100,000		
b) 10% adjustment for CWC nonrevenue water	10,000		
c) Amount sold to private entities at Tech Park	50,000		
		-160,000 gallons	
(3) Net Volume Water Delivered to UCONN		340,000 gallons @ SOIR Rate	$3.615 = $1229.10
(4) Water Delivered to Private Entities in Tech Park		50,000 gals @ CWC New Customer Rate	$5.464 = $ 273.20
		UCONN Bill	**$1502.30 Due**

***Example #2** – CWC net usage is more than what is delivered:*

(1) Water delivered at CWC Production Point		200,000 gallons	
(2) Total Volume of Water Received by CWC			
a. Metered off campus usage	250,000		
b. 10% adjustment for CWC nonrevenue water	25,000		
c. Amount sold to private entities at Tech Park	50,000		
		-325,000 gallons	
(3) Net Volume Water Delivered to UCONN		-125,000 gallons @ SOIR Rate	$3.615 =($451.88) credit
(4) Water Delivered to Private Entities in Tech Park		50,000 gals @ CWC New Customer Rate	$5.464 = $ 273.20
		UCONN Bill	**$178.67 Credit**

Exhibit 3.2(a)

Exhibit 3.2(a) Storrs Customer Rate
RATES AND CHARGES OF UCONN AS OF EFFECTIVE DATE OF AGREEMENT

University of Connecticut
Water Rate Schedule
Effective as of Sept. 13, 2011

WATER CHARGES

Connection Charge	$0
Domestic Water Use Metered Charge	$3.05 per 100 cubic feet $4.078 per 1000 gallons
Domestic Water Meter Fee	$100 per year
Domestic Water Use Flat Rate[1]	$340 per year

FIRE PROTECTION FLAT RATE:

Private Fire Charges

Connection Size	Annual Charge	Quarterly Charge
1"	$ 16.10	$ 6.2267
2"	$ 84.36	$ 23.2939
3"	$ 239.46	$ 62.0682
4"	$ 506.97	$ 128.9455
6"	$1467.06	$ 368.9671
8"	$3123.01	$ 782.9555
10"	$5613.90	$1405.6794
12"	$9066.19	$2268.7520

Public Fire Charges

	Quarterly Charge	Monthly Charge
Per Hydrant	$60.00	$20.00

[1] Domestic water use flat rate is reserved only for connections that do not have a water meter or a written agreement with Supplier. The Water Supply Rules and Regulations require that all connections have a water meter.

Miscellaneous Fees and Charges

Bulk water account activations	$50
Bulk water commodity charge	Metered rate = $3.05 per 100 cubic feet $4.078 per 1000 gallons
Unauthorized hydrant use	$200
Unauthorized water use	$300
Curb box repairs – equipment required	$300
Curb box repairs – hand dug	$100
Cross connection notice fee	$40

Special Charges

Service turn off (normal hours)	$40
Service turn off (after hours)	$60
Service turn on (normal hours)	$40
Service turn on (after hours)	$60
Service turn on- large meter <: 2" (normal hours)	$40
Service turn on- large meter <: 2" (normal hours)	$60
Service turn on at curb (normal hours)	$40
Service turn on (after hours)	$60
Service turn on – seasonal activation	$20
Frozen meter charge	$50
Frozen meter charge (after hours)	$75

Collection Fees

Returned check fee	$30
Late payment fee	1.5% per month[2]

[2] The interest charges are applied at the time of billing and are applied to past due amounts only. Monthly customers would have a one-month interest charge applied at the time of billing and quarterly customers would have a three-month interest charge applied at the time of billing (3 times the monthly interest rate).

EXHIBIT 3.2(a)

EXISTING OFF-CAMPUS CUSTOMERS/COMPLEXES CURRENTLY SERVED AND BILLED BY UCONN (2013)

Street No.	Street Name/Complex Served	Street No.	Street Name/Complex Served	Street No.	Street Name/Complex Served
9	Charles Smith Way/US Post Office	88	Gurlyville Rd	87	Hunting Lodge Rd
101	Courtyard Ln/Courtyard Condominiums	8	Hanks Hill Rd/ Hanks Hill Mobil Home Park	97	Hunting Lodge Rd
85	Depot Rd/Regional School Dist. 19	3	Hillside Cir	101	Hunting Lodge Rd
50	Depot Road/Mansfield Discovery Depot	5	Hillside Cir	105	Hunting Lodge Rd
1	Dog Ln/Storrs Center	6	Hillside Cir	109	Hunting Lodge Rd
9	Dog Ln/Storrs Center	7	Hillside Cir	115	Hunting Lodge Rd
11	Dog Ln/Storrs Center	8	Hillside Cir	122	Hunting Lodge Rd
11	Dog Ln	9	Hillside Cir	125	Hunting Lodge Rd
18	Dog Ln/UCPEA	10	Hillside Cir	131	Hunting Lodge Rd
48	Dog Ln	15	Hillside Cir	132	Hunting Lodge Rd
56	Dog Ln	17	Hillside Cir	134	Hunting Lodge Rd
1	Eastwood Rd	18	Hillside Cir	135	Hunting Lodge Rd
2	Eastwood Rd	19	Hillside Cir	146	Hunting Lodge Rd
3	Eastwood Rd	20	Hillside Cir	153	Hunting Lodge Rd
4	Eastwood Rd	21	Hillside Cir	156	Hunting Lodge Rd
5	Eastwood Rd	22	Hillside Cir	163	Hunting Lodge Rd
6	Eastwood Rd	23	Hillside Cir	180	Hunting Lodge Rd
7	Eastwood Rd	25	Hillside Cir	16	King Hill Rd
8	Eastwood Rd	11	Hunting Lodge Rd	28	King Hill Rd
9	Eastwood Rd	15	Hunting Lodge Rd	10	Meadowood Rd
10	Eastwood Rd	16	Hunting Lodge Rd	11	Meadowood Rd
11	Eastwood Rd	22	Hunting Lodge Rd	21	Meadowood Rd
12	Eastwood Rd	23	Hunting Lodge Rd	28	Meadowood Rd
13	Eastwood Rd	27	Hunting Lodge Rd	290	Middle Tnpk
14	Eastwood Rd	28	Hunting Lodge Rd	4	Moulton Rd
15	Eastwood Rd	34	Hunting Lodge Rd		
16	Eastwood Rd	43	Hunting Lodge Rd		
17	Eastwood Rd	57	Hunting Lodge Rd		
18	Eastwood Rd	80	Hunting Lodge Rd		
19	Eastwood Rd	81	Hunting Lodge Rd		
20	Eastwood Rd				
22	Eastwood Rd				

EXHIBIT 3.2(a)(2)

EXISTING OFF-CAMPUS CUSTOMER ADDRESSES/COMPLEXES CURRENTLY SERVED AND BILLED BY UCONN

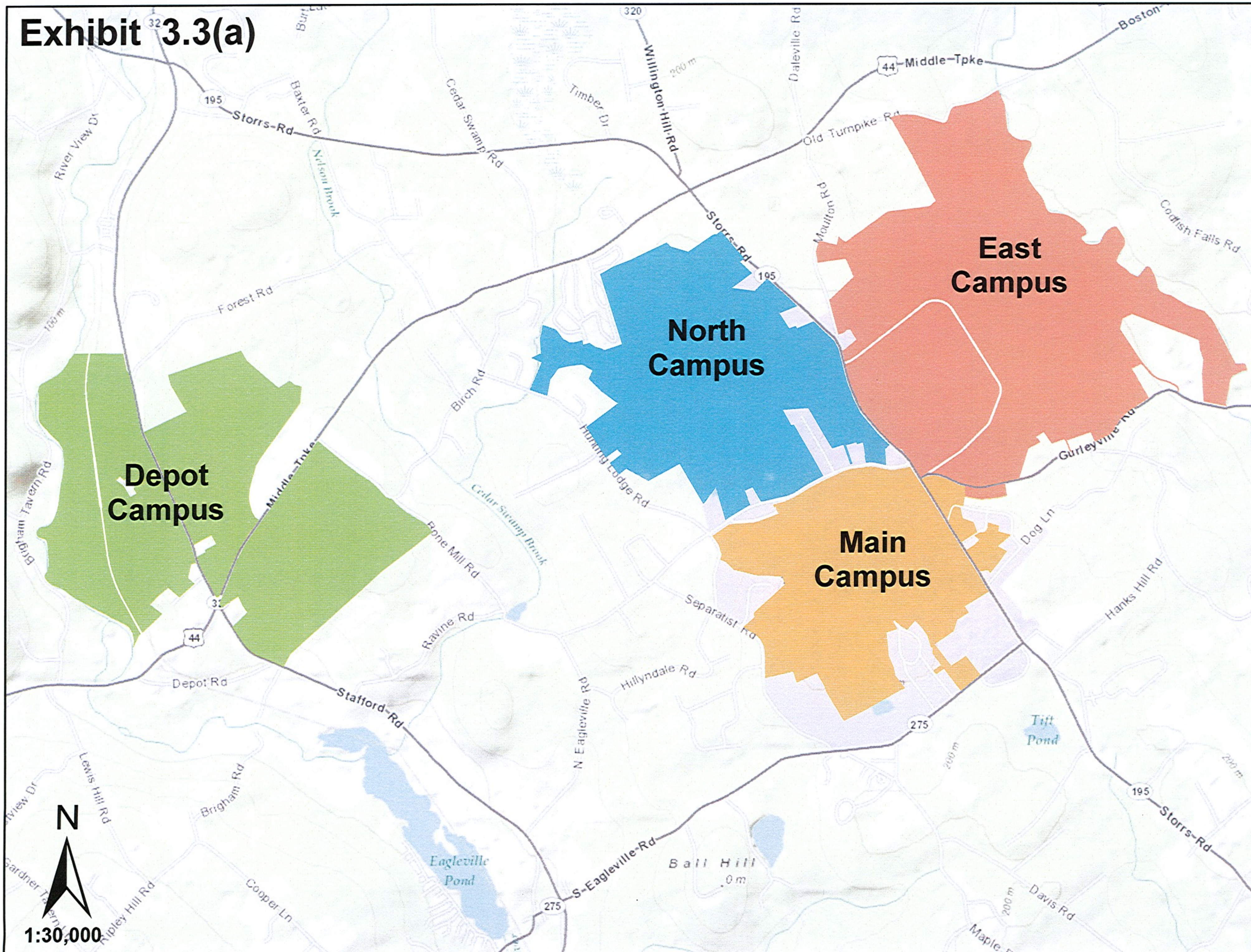
Street No.	Street Name/Complex Served	Street No.	Street Name/Complex Served	Street No.	Street Name/Complex Served
9	Charles Smith Way/US Post Office	88	Gurlyville Rd	87	Hunting Lodge Rd
101	Courtyard Ln/Courtyard Condominiums	8	Hanks Hill Rd/ Hanks Hill Mobil Home Park	97	Hunting Lodge Rd
85	Depot Rd/Regional School Dist. 19	3	Hillside Cir	101	Hunting Lodge Rd
50	Depot Road/Mansfield Discovery Depot	5	Hillside Cir	105	Hunting Lodge Rd
1	Dog Ln/Storrs Center	6	Hillside Cir	109	Hunting Lodge Rd
9	Dog Ln/Storrs Center	7	Hillside Cir	115	Hunting Lodge Rd
11	Dog Ln/Storrs Center	8	Hillside Cir	122	Hunting Lodge Rd
11	Dog Ln	9	Hillside Cir	125	Hunting Lodge Rd
18	Dog Ln/UCPEA	10	Hillside Cir	131	Hunting Lodge Rd
48	Dog Ln	15	Hillside Cir	132	Hunting Lodge Rd
56	Dog Ln	17	Hillside Cir	134	Hunting Lodge Rd
1	Eastwood Rd	18	Hillside Cir	135	Hunting Lodge Rd
2	Eastwood Rd	19	Hillside Cir	146	Hunting Lodge Rd
3	Eastwood Rd	20	Hillside Cir	153	Hunting Lodge Rd
4	Eastwood Rd	21	Hillside Cir	156	Hunting Lodge Rd
5	Eastwood Rd	22	Hillside Cir	163	Hunting Lodge Rd
6	Eastwood Rd	23	Hillside Cir	180	Hunting Lodge Rd
7	Eastwood Rd	25	Hillside Cir	16	King Hill Rd
8	Eastwood Rd	11	Hunting Lodge Rd	28	King Hill Rd
9	Eastwood Rd	15	Hunting Lodge Rd	10	Meadowood Rd
10	Eastwood Rd	16	Hunting Lodge Rd	11	Meadowood Rd
11	Eastwood Rd	22	Hunting Lodge Rd	21	Meadowood Rd
12	Eastwood Rd	23	Hunting Lodge Rd	28	Meadowood Rd
13	Eastwood Rd	27	Hunting Lodge Rd	290	Middle Tnpk
14	Eastwood Rd	28	Hunting Lodge Rd	4	Moulton Rd
15	Eastwood Rd	34	Hunting Lodge Rd		
16	Eastwood Rd	43	Hunting Lodge Rd		
17	Eastwood Rd	57	Hunting Lodge Rd		
18	Eastwood Rd	80	Hunting Lodge Rd		
19	Eastwood Rd	81	Hunting Lodge Rd		
20	Eastwood Rd				
22	Eastwood Rd				

EXHIBIT 3.2(a)(2)

EXISTING OFF-CAMPUS CUSTOMER ADDRESSES/COMPLEXES CURRENTLY SERVED AND BILLED BY UCONN

125	N Eagleville Rd	1254	Stafford Rd	18	Westwood Rd
134	N Eagleville Rd/College Square	1279	Stafford Rd	19	Westwood Rd
153	N Eagleville Rd (46 King Hill Rd)	1281	Stafford Rd	23	Westwood Rd
188	N Eagleville Rd	1286	Stafford Rd	24	Willowbrook Rd
194	N Eagleville Rd	1289	Stafford Rd	25	Willowbrook Rd
197	N Eagleville Rd	1308	Stafford Rd	28	Willowbrook Rd
202	N Eagleville Rd	1340	Stafford Rd	31	Willowbrook Rd
203	N Eagleville Rd	1204	Storrs Rd/Storrs Commons	34	Willowbrook Rd
204	N Eagleville Rd	1232	Storrs Rd/University Plaza	39	Willowbrook Rd
207	N Eagleville Rd	1235	Storrs Rd/EO Smith High School	47	Willowbrook Rd
208	N Eagleville rd	1244	Storrs Rd	52	Willowbrook Rd
213	N Eagleville rd	1310	Storrs Rd	57	Willowbrook Rd
219	N Eagleville Rd	1332	Storrs Rd	58	Willowbrook Rd
	Northwood Rd/Uconn Northwood Apartments	100	Warren Road/Mansfield Ctrfor Nursing & Rehab.	64	Willowbrook Rd
19	Oak Hill Rd	1	Westwood Rd	67	Willowbrook Rd
28	Oak Hill Rd	2	Westwood Rd	76	Willowbrook Rd
32	Oak Hill Rd	4	Westwood Rd	82	Willowbrook Rd
33	Oak Hill Rd	5	Westwood Rd	85	Willowbrook Rd
37	Old Colony Rd	6	Westwood Rd		Wrights Way/Wrights Village
38	Old Colony Rd	7	Westwood Rd		Zygmunt Dr./Holinko Estates
1	Penner Pl./Celeron Square	8	Westwood Rd		
1	Royce Circle/Storrs Center	9	Westwood Rd		
1	S Eagleville Road/Mansfield Apartments	10	Westwood Rd		
4	S Eagleville Rd/Audry Beck Municipal Bldg	11	Westwood Rd		
10	S Eagleville Rd/Mansfield Community Ctr	12	Westwood Rd		
222	Separatist Rd	13	Westwood Rd		
1	Silo Circle/Glen Ridge	14	Westwood Rd		
1	Silo Road/Juniper Hills	15	Westwood Rd		
1208	Stafford Rd	16	Westwood Rd		
1250	Stafford Rd	17	Westwood Rd		

Exhibit 3.3(a)



East Campus
North Campus
Main Campus
Depot Campus
N
1:30,000
Storrs-Rd
Middle-Tpke
Willington-Hill-Rd
Old Turnpike Rd
Boston
Daleville Rd
Timber Dr
Cedar Swamp Rd
Baxter Rd
Nelson Brook
River View Dr
Forest Rd
Birch Rd
Hunting Lodge Rd
Moulton Rd
Codfish Falls Rd
Gurleyville Rd
Dog Ln
Hanks Hill Rd
Separatist Rd
Hillyndale Rd
N Eagleville Rd
Cedar Swamp Brook
Bone Mill Rd
Ravine Rd
Depot Rd
Stafford-Rd
Eagleville Pond
S-Eagleville-Rd
Ball Hill
Tift Pond
Davis Rd
Lewis Hill Rd
Brigham Rd
Cooper Ln
Ripley Hill Rd
Brigham Tavern Rd

Exhibit 6.1

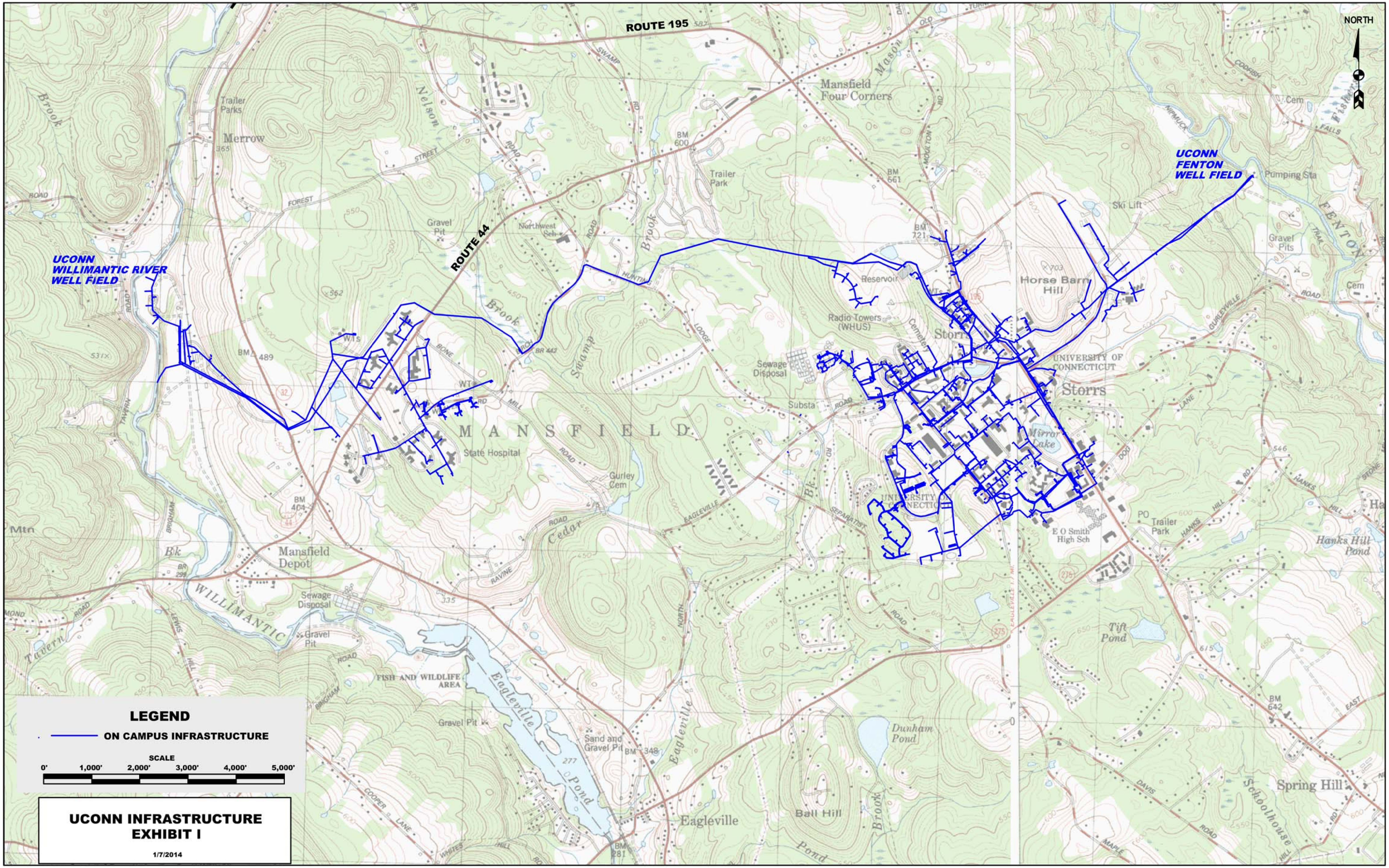
UConn Off-Campus Infrastructure Depreciation Schedule

Exhibit 6.1 UConn Off-Campus Infrastructure Depreciation Schedule

DISTRIBUTION SYSTEM						
Main Campus	***Description***	***Construction***	***Diamater***	***Length***	***Year Installed***	***Year Fully Devalued***
No. Eagleville Road	West from LeDoyt Road to Huntinglodge Road	DI	10"	1,290 ft	1985	2045
No. Eagleville Road	West of Huntinglodge Road to Northwood Road	DI	10"	2,220 ft	2000	2060
No. Eagleville Road	West From LeDoyt Road to Northwood Road	CI	6"	3,510 ft	1920s	1980s
Northwood Road (University land)	From North Eagleville road north to terminus.	DI	6"	740 ft	2002	2062
Hunting Lodge Road	North from No. Eagleville Road to Holinko	DI	8"	3,850 ft	1991	2051
Hunting Lodge Road	South from No. Eagleville road to 11 Hunting Lodge Road	DI	6"	1,560 ft	1991	2051
Meadowood Road	From North Eagleville to 28 Meadowood Road	DI	10"?	870 ft	2003	2063
Hillside Circle	From Hillside Road to Hillside Road	Transite	8"	2,130 ft	1939	1999
Eastwood Road	From Hillside Circle to South Eagleville Road	CI	8"	1,160 ft	1952	2012
Westwood Road	From Hillside Circle to South Eagleville Road	CI	8"	1,250 ft	1952	2012
Willowbrook Road	From Rt. 195 to 35 Dog Lane	CI	6"	2,200 ft	1920s - 1930s	1980s-1990s
Willowbrook Road	??	DI	4"	210 ft	2005	2065
Rt. 195/Storrs Road	Bolton Road to So. Eagleville Road	CI	8"	1,260 ft	2012	2072
South Eagleville Road	From Rt. 195 to 655' west of Maple Road	CI	8"	4,510 ft	1950	2010
Service to Post Office (in road)	From Rt. 195 to Post Office	DI	8"	500 ft	1975	2035
Dog Lane	From Royce Circle (western terminus) to Willow Brook Road	DI	12"	900 ft	2012	2072
Royce Circle/Wilbur Cross Way	From Bolton Road Ext. to Post Office Road	DI	12"	1540 ft	2013	2073
Royce Circle	From Bolton Road Ext. to Dog Lane	DI	12"	280 ft	2012	2072
Bolton Road Extention	From Rt. 195 to Royce Circle	DI	12"	160 ft	2010	2070
			subtotal	30,140 ft		
			subtotal	5.7 mi		
Depot Campus						
Rt. 32/Stafford Road (cross country)	From Spring Manor Lane to 250' east of Rt. 44/Middle Turnpike	CI	8"	650 ft	Unknown, <1953	fully devalued
Rt. 32/Stafford Road (cross country)	From Rt. 44/Middle Turnpike to 1208 Stafford Road (Willow House) to Depot Road RR cross	DI	8"	1540 ft	1989	2049
Depot Road (cross country)	From 1208 Stafford Road to 50 Depot Road (Discovery Depot)	DI	8"	1020 ft	1989	2049
Depot Road	From 330' south of Stafford Road to 85 Depot Road (Reynolds School)	DI	8"	1200 ft	2007	2067
Old Colony Road	From Rt. 32 to 30 Old Colony Road	CI	6"	430 ft	Unknown, <1953	fully devalued
Old Colony Road	From 30 Old Colony Road to terminus	CI	4"	530 ft	Unknown, <1953	fully devalued
			subtotal	5370 ft		
			subtotal	1.0 mi		
			total	6.7 mi		

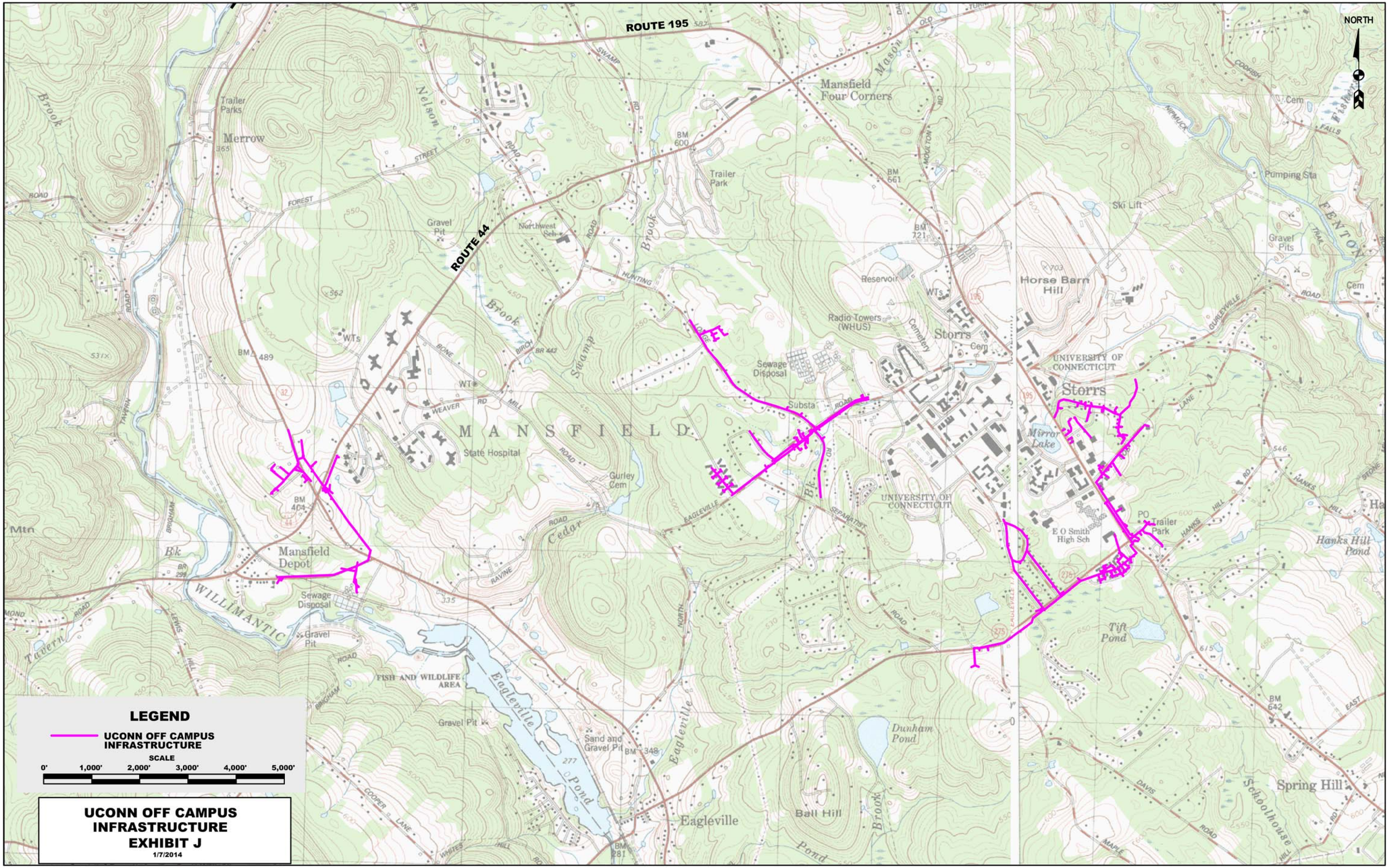
DI = ductile iron

CI = cast iron



UCONN INFRASTRUCTURE
EXHIBIT I

1/7/2014



UCONN OFF CAMPUS
INFRASTRUCTURE
EXHIBIT J
1/7/2014
LEGEND
UCONN OFF CAMPUS INFRASTRUCTURE
SCALE
0'
1,000'
2,000'
3,000'
4,000'
5,000'
NORTH
ROUTE 195
ROUTE 44
Merrow
Trailer Parks
Nelson
Brook
Mansfield Four Corners
Mason
Trailer Park
Gravel Pit
Northwest Sch
Horse Barn Hill
Ski Lift
Pumping Sta
Gravel Pits
Reservoir
Radio Towers (WHUS)
Storrs
Cem
Cemetery
UNIVERSITY OF CONNECTICUT
Sewage Disposal
Substa
M A N S F I E L D
State Hospital
Swamp
Gurley Cem
Mirror Lake
E O Smith High Sch
PO
Trailer Park
Hanks Hill Pond
Mansfield Depot
WILLIMANTIC
Cedar
Tift Pond
FISH AND WILDLIFE AREA
Gravel Pit
Eagleville Pond
Sand and Gravel Pit
Dunham Pond
Eagleville
Ball Hill
Schoolhouse
Spring Hill

STANDARD OPERATING PROCEDURES

For University of Connecticut and

Connecticut Water Company for

Water System in Storrs/Mansfield, CT

STATEMENT OF PURPOSE

This document will serve as a guideline for the operation and maintenance of Connecticut Water's UCONN Mansfield Supply system and the Connection to the University of Connecticut. Outlined in this document are the operational responsibilities for Connecticut Water, the University and the Operator of the University Water System.

This document has been prepared as provided by the Water Supply and Development Agreement of December 18, 2013, as executed by CWC and UConn (the "Agreement"), to document the practices and procedures to implement the operations contemplated by that Agreement, and nothing herein is intended to modify the rights and obligations of the parties under the Agreement.

THE UNIVERSITY OF CONNECTICUT

By: Stanley L Nolan

Name: Stanley L. Nolan

Title: Director of Utility Operations and Energy Management

CONNECTICUT WATER COMPANY

By:

Name: Craig J. Patla, P.E.

Title: Vice President – Service Delivery

Table of Contents

I. DEFINITIONS

"Agreement" shall mean the "Water Supply and Development Agreement" between the University of Connecticut and the Connecticut Water Company entered into on December 18th 2013.

"Basic Service Charge" shall mean the PURA-approved monthly charge to be paid by a CWC water customer based on the meter size of the customer service connection and the applicable schedule of approved rates for CWC Year Round customers, or a successor charge established by PURA to replace the use of the Basic Service Charge.

"Billed Customers" shall mean those persons, associations, partnerships or corporations of record as having a legal obligation to pay for Potable Water supply service as the owners of real property receiving water or tenants thereof having an obligation to pay for water pursuant to an agreement with the real property owner.

"Connecticut General Statutes" or "C.G.S" shall mean the State of Connecticut General Statutes, Revision of 1958, revised to 2013, and as revised and amended from time to time.

"CTDEEP" shall mean the Connecticut Department of Energy and Environmental Protection, or its successor as established by Law.

"CTDPH" shall mean the Connecticut Department of Public Health, or its successor as established by Law.

"CWC Regulations" shall mean the Rules and Regulations of the Connecticut Water Company as approved by PURA on July 14, 2010, and revisions and amendments thereto not inconsistent with the Agreement.

"Deficiency Notice" shall mean a circumstance as specified with respect to the Completion Notice.

"Delivery Point" shall mean the connection between CWC infrastructure and UConn infrastructure at Meter Pit "A".

"Diversion Permit" shall mean an authorization issued by the CTDEEP pursuant to the Water Diversion Policy Act, C.G.S. §§22a-365 *et seq.*, as amended, in such form as required by CTDEEP for the purpose of authorizing CWC to provide water to UConn as required by the Agreement.

"Emergency" shall mean an unexpected event or occurrence in CWC's distribution system that adversely affects CWC's ability to fulfill its obligation under the Agreement or an unexpected event or occurrence in UConn's distribution system that adversely affects UConn's ability to fulfill its obligation under the Agreement.

"Existing Customers" shall mean all current Billed Customers served by UConn with the exception off those water users entitled to the SICR also referred to as the Interim

UCONN Wholesale in the PURA decision of November 2, 2016. These shall become direct CT Water customers as of the Completion Date.

"Governmental Authority" means any federal, state, departmental or municipal government or any political subdivision thereof, and any other entity exercising executive, legislative, judicial, regulatory or administrative functions of or pertaining to government, and any other governmental entity but excluding in all cases UConn.

"Licenses and Permits" shall mean any license, permit, registration, certificate, order, approval, franchise, variance and similar right issued by or obtained from any Governmental Authority or any third party that is required in connection with the operation of a Party's water supply system, the Capital Improvements or the Supply Source Improvements.

"Meter" shall mean a water volume measuring device (meeting design, type and specifications per industry standards and PURA regulations) that is used for the purpose of measuring water volumes as provided in this Agreement.

"Meter Pit A" shall mean the meter pit to be constructed by UConn in the Town of Mansfield, on the west side of Route 195 directly across from 15 Moulton Road.

"Net Volume" shall mean and be calculated as the water delivered by CWC to the Delivery Point, reduced by: i) the total of the volume of metered water delivered by CWC to CWC customers downstream of the Delivery Point and served by the Capital Improvements, and ii) the volume of metered water delivered to non-university customers in the UConn Technology Park for which the revenues will be transferred by UConn to CWC, and increased by a percentage adjustment established annually by the Parties to reflect a reasonable estimate of the volume of nonrevenue water (e.g. system leaks, fire flows) in the system supplied by CWC downstream of the Delivery Point and via the Capital Improvements. In the event that either Party reasonably believes that the method of calculating Net Volumes described above is inaccurate, the Parties agree to meet and negotiate in good faith to arrive at an alternate method of calculating Net Volumes that is more accurate, provided that alternate method can be accomplished at a reasonable cost and is in conformance with prevailing industry practices.

"New Customers" shall mean all Billed Customers after the Completion Date who shall be direct customers of CWC that are not Existing Customers, and shall be charged by CWC at the New Customer Rate.

"Notice of Completion" shall mean a written notice from CWC confirming the completion of all necessary or appropriate construction and testing of Capital Improvements in conformance with the requirements of the Agreement.

"Operator" shall mean the current entity under contract to manage and operate the University Water System.

"Peak Day Demand Volume" or "PDDV" shall mean 1.5 million gallons per day. The PDDV may be amended from time to time by mutual agreement of the Parties.

"Person" shall mean any natural person, estate, partnership, corporation, trust, unincorporated association, limited liability company, joint venture, organization, business, individual, municipality, government or any agency or political subdivision thereof, tribal nation, tribe or any other entity.

"Potable Water" shall mean water of a quality meeting, or of a quality higher than, those standards for quality of drinking water established by the CTDPH pursuant to C.G.S. § 19a-36, including R.C.S.A. § 19-13-B102, and as such standards may be revised or amended from time to time.

"Production Points" shall mean those locations in the UConn campus water infrastructure where its wells connect to the water supply and distribution system.

"Public Authority Commodity Charge Rate" shall mean the PURA-approved commodity charge as specified in CWC's rate schedule to be paid to CWC by public authority customers based on metered water volumes delivered to such customers, or a successor charge established by PURA to replace the use of the Public Authority Commodity Charge Rate.

"PURA" shall mean the Public Utilities Regulatory Authority presently within the CTDEEP, or its successor as established by Law.

"PRV" shall mean a pressure reducing valve in Meter Pit "A" used to regulate pressure and flow to meet the UConn system HGL and CT Water off campus customer and UConn System demand.

"R.C.S.A." shall mean the Regulations of Connecticut State Agencies, and as revised and amended from time to time.

"Reasonable Efforts" shall mean the taking of any and all actions which are commercially reasonable under the circumstances and reasonably required to accomplish the desired task or achieve the desired result.

"Sale of Excess Water Permit" shall mean an authorization issued by CTDPH pursuant to the C.G.S. §22a-358, as amended, as may be required for the purpose of allowing the sale of water between CWC and UConn pursuant to the Agreement.

"State Infrastructure Customer Rate" also referred to as the Interim UCONN Wholesale in the PURA decision of November 2, 2016 is the rate equal to sixty percent (60%) of the Public Authority Commodity Charge Rate and the Basic Service Charge based on the size of the meter(s) at Meter Pit "A", each as approved by PURA from time to time.

“Substantial Completion” shall mean that degree of completion of construction of the Capital Improvements or Campus Connection Spur sufficient to allow for preliminary testing of such infrastructure.

“UConn System” shall mean the water distribution pipes, pumps, tanks and related appurtenances located on the UConn campus.

“UConn System HGL” shall mean the hydraulic grade line of the UConn system set by the UConn Towers tanks overflow elevation (790 USGS).

"Water utility or utilities" referenced herein shall mean Connecticut Water and/or the University of Connecticut public water system.

“Work Order Control” shall mean The Facilities Operations department which handles 24 hour maintenance requests for the University. The Work Order Control Center provides a point of contact for the entire campus. This group acts as the communication center for all complaints, requests for repairs, and emergencies.

II. WATER SUPPLY SERVICE AND OPERATING PARAMETERS

Quantity

The Diversion Permit #DIV201404187 issued under Section 22a-368 of the CGS authorizes CWC to transfer a maximum of 1.85 million gallons per day of potable water from CWC's Northern Operations Western System to Mansfield and the University of Connecticut's public water system, as measured at the Coventry/Mansfield line. The Diversion Permit expires on May 29, 2040. The terms of the permit and the reporting requirements under the permit are more fully explained in Section VII and Addendum "A".

Pressure

Potable Water is provided by CWC to the Delivery Point to meet the UConn System HGL which is the pressure necessary to ensure proper service to UConn and customers to whom CWC connects through the UConn System, but in no case shall normal pressures be less than 25 psi or greater than 125 psi. UConn shall operate the UConn System in a manner to provide proper service to UConn and customers to whom CWC connects through the UConn system, but in no case shall normal pressures be less than 25 psi or greater than 125 psi.

General Operation Parameters for Meter Pit A at the Delivery Point

Water is supplied to the Delivery Point through Meter Pit A. Normal operation is achieved with water supplied through a 4" low flow supply line and a 12" high flow supply line, depending on demand. Both supply lines are equipped with a properly sized PRV and turbo meter.

Selectable flow rate through the low flow supply line's 4" PRV is controlled remotely by UConn SCADA. The selected flow will be a minimum flow rate provided by CWC based on the previous month off campus meter readings, plus any additional flow required to serve the University system. Flow will be continuous unless the SCADA feedback indicates University tanks have reached shut off set point elevation of 780', in which case the low flow supply PRV will close until such time as tank level reaches the automatic open set point elevation of 778'.

The high flow supply line shall supply additional flow, without flow control, required to serve the University system. Flow through the high flow supply line is based on maintaining a continuous set downstream pressure corresponding to a HGL of 765'.

Emergency operation to supply water to CWC from UConn or UConn from CWC is achieved through the use of the unmetered bypass supply line. The bypass supply line is equipped with a lockable gate valve. Operation of this gate valve will be by the Operator and will be authorized upon mutual approval of CWC and UConn.
CWC is responsible for the calibration of the meters contained in Meter Pit A, at a frequency of no less than once every two years (biennially).

UConn and the Operator are responsible for the calibration and maintenance of the tank level controls for the UConn Towers tanks. The tank level monitors consist of pressure transducers, one at the bottom of each of the two 1.0 MG standpipes and one at the base of the 5.4 MG High Head reservoir. Transducer readings are recorded at a frequency of once every 15 minutes and are reviewed by UConn personnel regularly but no less than daily. If a transducer is reporting a value that is inconsistent with the other transducers, it is checked and replaced as needed.

Meter Pit A is owned by UCONN and UCONN shall be solely responsible for the maintenance associated with Meter Pit A except that CWC shall own and is responsible for the cost of providing the water meter used in Meter Pit A and testing, maintenance, repair and replacement of such meter.

CWC also owns and shall be solely responsible for the testing, maintenance, repair and replacement of the following equipment:

Qty 1 – Allen Bradley Micrologix 1400 PLC
Qty 1 – Allen Bradley Panelview HMI
Qty 4 – Allen Bradley Analog Cards
Qty 1 – Entron 105 TX Cellular Modem and Antenna
Qty 1 – Sensus Act Pak (4”)
Qty 1 – Sensus Act Pak (10”)
Qty 2 – Analog Isolator (flow rate)

Periodic Flushing

CWC shall perform routine periodic flushing in accordance with CWC’s Northern Western flushing program. Notice to UCONN and the OPERATOR as outlined in the Notices section.

UCONN shall give CWC notice of any periodic routine flushing as outlined in the Notices section.

CWC shall coordinate flushing of CT Water off campus facilities with any flushing performed within the UCONN system.

III. OPERATIONAL NOTICES

To the extent the water systems are interconnected and integrated, operational activities and service interruptions in one system may impact the operations of the other water utility's system. As such, notice of specific activities shall be provided in accordance with provisions outlined in this section and the parameters in Table 1.

Contacts for such notice shall be as follows:

	Contact	Phone	Website/Email
CWC Contact	**CT Water Call Center**	**1-800-286-5700**	https://www.ctwater.com/contact-us
UConn Contact	**Work Order Control**	**860-486-3113**	http://fo.uconn.edu/work-order-control/
Operator Contact	**On Site Manager**	**860-486-1081**	BBuhler@ctwater.com

To the extent that these contacts may change from time to time, it will be the responsibility of that utility to notify the other party and provided an updated version of this section of this Operations Manual to all parties.

<u>Annual Notices regarding system sources, improvements or projected demands</u>

The parties shall provide an annual December notice as follows:

- CWC- the status of Supply Source Improvements and the schedule of measures to be taken by CWC during the following year to ensure that CWC will have a readily available supply of water required for CWC to meet UConn water supply needs taking into account the projected UConn water demand timeline and volumes.

- UConn - any anticipated changes to the projected UConn water demand timeline and volumes for the following year.

TABLE 1

Notice Requirements		
Event	**Description**	**Required Notice**
Main Break or Service Interruption	A main break or unscheduled service interruption in CWC's system which could affect volume or quality of water at the Delivery Point or the University system that affects volume or quality of water to CWC's customers	Notify within 2 hours of discovery of break
Planned Service interruption	A planned service interruption in CWC's system that affects volume or quality of water at the Delivery Point or the University system which could affect volume or quality of water to CWC's customers	Notify 72 hours prior to the service interruption
Periodic System Flushing	Scheduled periodic flushing of the CWC's or the University system	Notify 72 hours prior to scheduled flushing
Water quality inquiry	If CWC or UConn identifies a water quality concern with respect to their own system or the other Party's system they shall notify the other Party and provide all available information regarding the nature of the water quality concern, including test results, expert reports or other documentation.	The concerned Party shall notify the other Party and provide all available information regarding the nature of the water quality concern, including test results, expert reports or other documentation in a reasonable time frame and as required by Public Health Code. Oral notification shall be provided within 24 hours of the notifying party's identification of a water quality concern. Written notification, including delivery of relevant documentation, shall be provided electronically within 24 hours of oral notification.

Notice of Intended Change of HGL	Any proposed change of the UConn System HGL which could affect CWC's ability to meet the terms of the Agreement or affect UConn's ability to provide adequate pressure to CWC off campus customers	UConn shall provide CWC with written notice 12 months prior to such proposed change of HGL.
Diversion Permit Exceedence Notice	Any exceedence of permit limits for the transfer of water from the CT Water system to the Town of Mansfield and UConn system	CWC shall notify UConn as soon as practicable but not later than 24 hrs before DEEP notification

IV. EMERGENCY PROCEDURES

An emergency shall be defined as an event or occurrence in either water utility system that adversely affects such utility's ability to fulfill its obligations under the Agreement. Should such an emergency occur, the water utility shall follow the emergency protocol outlined in its Water Supply Emergency Contingency Plan.

Should an emergency occur in CWC's distribution system, notification shall be provided by phone within 2 hours to explain the nature of the emergency and coordinate an appropriate response.

In addition to the standard notifications required to the CT Water Call Center or the UCONN Work Order Control, in such emergencies there shall be contact from and to:

- CWC Director of Service Delivery or their designee

  David Connors
  DConnors@ctwater.com
  (860)-664-6141 (office)(860)-227-4902 (cell)

- Director of Utility Operations & Energy Management or their designee

  Stanley Nolan
  Stanley.nolan@uconn.edu
  (860) 486-3208 (office)
  (860) 267-4063 (cell)

- Operator Contact – On Site Manager (normal hours)

  Brant Buhler

New England Water Utility Services (NEWUS)
bbuhler@ctwater.com
860-622-9564 (cell)

Unmetered Bypass Operation

Upon an emergency condition for CWC's distribution system, CWC shall notify UConn of its desire to activate flow through the unmetered bypass from UConn to CWC at the Delivery Point and CWC will provide to UConn an estimate of the amount needed to address the emergency condition. UConn will review the amount to determine if it can be delivered. If UConn determines it cannot fulfill the requested amount, it will notify CWC of the maximum amount it can provide.

Upon an emergency condition within Meter Pit A at the Delivery Point whereby both supply lines are inoperable, UConn shall notify CWC of its desire to activate flow through the unmetered bypass from CWC to UConn at the Delivery Point and UConn will provide to CWC an estimate of the amount needed to address the emergency condition. CWC will review the amount to determine if it can be delivered. If CWC determines it cannot fulfill the requested amount, it will notify UConn of the maximum amount it can provide.

Upon activation of the unmetered bypass, UConn and CWC will confer daily to assess the needs of each party and to assess and potentially modify the parameters of the supply.

V. WATER QUALITY ASSURANCE PRACTICES

CWC shall supply and deliver Potable Water at the Delivery Point. UConn shall supply and deliver Potable Water at all points at which water leaves the UConn System to serve CWC off-campus customers.

CWC shall timely perform, at its sole cost and expense, all requirements for management of disinfection byproducts in that portion of the UConn System in which CWC-supplied water passes including all monitoring, sampling, reporting, treatment, flushing and cleaning required by Law concerning disinfection byproducts.

Quality of the water being supplied by the 16-inch transmission main will be monitored by CWCat the meter pit for disinfection byproducts (DBPs), bacteriological water quality, and physical parameters at the same frequency as the Water Quality Monitoring and Compliance Schedule for the Northern Reg - Western System (CT0473011) attached in Addendum “B”. Laboratory results for samples collected by CWC at the meter pit shall be reported directly to UConn, but will not be reported to CTDPH for compliance purposes. Any increased monitoring required for compliance purposes according to the Water Quality Monitoring and Compliance Schedule under the ST2DBPR or RTCR for the Northern Reg-Western System (CT0473011) shall result in a corresponding increase in monitoring at the meter pit. Conversely, CTDPH approval of waivers which would reduce the frequency of water quality monitoring for compliance purposes under the ST2DBPR or RTCR in the Northern Reg - Western System will not affect monitoring frequency at the meter pit. This ensures that, at a minimum, the following sample schedule will be adhered to for water quality monitoring at the meter pit:

- ONE sample for bacteriological and physical analysis – MONTHLY.
- ONE sample for DBP analysis (HAA5s and TTHMs) – QUARTERLY

Physical parameters shall include: color, odor, turbidity, pH (field), temperature (field), and residual chlorine concentration (field).

In addition, once annually CWC will monitor the potability profile of the water delivered at the meter pit in order to track any changes in water quality over time. The standard potability profile shall include analysis for the following: *bacteriological/physical parameters, nitrate/nitrite, hardness, chloride, sulfate, sodium, calcium, magnesium, iron, and manganese.*

Quality of the water being supplied by the 16-inch transmission main will also be monitored, as part of CWC Northern Reg - Western System's (CT0473011) compliance monitoring, through routine samples collected at Jensen's Rolling Hills in Mansfield, Connecticut. The approved Water Quality Monitoring and Compliance Schedule for CT0473011 lists CLUB *HOUSE (MW001)* as the location of maximum residence time, and sampling for DBPs must be conducted there quarterly. The Water Quality Monitoring and Compliance Schedule for CT0473011 is included in Addendum "B." A map of the *CLUB HOUSE (MW001)* location is also provided in Addendum "B." Several locations within the former Jensen's Rolling Hills water system are eligible for sampling to test for bacteriological and physical parameters under the total coliform rule. A sample will be collected for bacteriological/physical analysis from one of the approved sample sites monthly.

Water quality monitoring of the UConn PWS (CT0780021) east (typ., "downstream") of the meter pit shall continue in accordance with the system's Water Quality Monitoring and Compliance Schedule attached in Addendum "B".

CWC shall ensure that UConn is provided with timely copies of all information secured by CWC, and all filings with CTDPH, in connection with compliance with this provision of the Agreement.

CWC shall provide UConn with any public notifications regarding changes in water quality or an exceedance of state or federal public health standards for drinking water which are sent to those customers of the Northern Reg-Western System along the transmission main supplying UConn or at the former CWC – Jensen's Rolling Hills.

UConn shall be responsible to address, at its sole cost and expense, any exceedence of CTDPH standards for radionuclides and arsenic that occurs at all points at which water leaves the UConn System to serve CWC off-campus customers.

Water quality data relating to DPH Compliance shall be shared reciprocally between CT Water and UConn.

Water Quality Concerns

The intention of the Parties is to exchange information so that appropriate operational action may be taken to mitigate adverse effects of water quality concerns, and to facilitate each party timely complying with all requirements of Law.

In the event of a water quality concern being identified by either Party with respect to their own water system or the other Party's water system, through testing or otherwise, the following shall apply:

1. Notice of Water Quality Inquiry shall be provided as outlined in the Notices section.
2. Cooperate to Investigate. The Parties agree to cooperate to timely: a) evaluate available information, and b) conduct such additional investigations as required to confirm the nature and cause of the water quality concern.
3. Implementation of Remedy. The Parties agree to cooperate to identify and implement a timely and effective remedy to address the cause of any confirmed water quality concern.

VI. CWC CONFIDENTIAL INFORMATION FOR SEWER CHARGE BILLING BY UCONN

CWC agrees to timely provide UConn with water use data for all CWC customers in Mansfield for whom UConn provides sewer service. It is the intention of the Parties to maintain the confidentiality of such water use data as required by C.G.S. §16-262c(e), and the Parties agree to cooperate to comply with C.G.S. §16-262c(e) in response to a request for release of protected information. An agreement between CWC and the University authorizing the terms and conditions of the use of such customer information shall be executed and remain in effect for CWC to provide that customer data.

VII. DIVERSION PERMIT COMPLIANCE TASKS, SCHEDULES

The delivery of water between the water systems is subject to the terms and conditions of permit #DIV201401487 issued under Section 22a-368 of the CGS. Said permit was issued on June 2, 2015 and is in effect until May 29, 2040.

The parties agree to adhere to the terms and conditions of such permit. A copy of the permit is included in Appendix A with a summary of key conditions for the parties to maintain compliance with said permit.

Annual Diversion Permit Reporting

CWC and UCONN mutually agree to provide each other a draft copy of their Annual Report required pursuant to the DEEP diversion permit by February 14th of each year followed by a final copy when submitted to the Commissioner.

VIII. SALE OF EXCESS WATER PERMIT

CWC currently holds a Sale of Excess Water Permit (#SEW15-01R) allowing sale of up to 1.5 MGD to UConn. This permit expires January 14th, 2025 and CWC has the responsibility to renew this permit.

As outlined in the Agreement, UConn has agreed to restrict water usage in the same manner as CWC in accordance with CWC's Western Region Northern System water supply plan emergency contingency provisions. A copy of this permit is located in Addendum "C".

IX. CUSTOMER AND BILLING RATES

The following table summarizes rates for service provided by CWC to serve CWC customers at the University of Connecticut and Storrs, as per the Agreement.

Customer	Rate	Notes
University	**State Infrastructure Customer Rate** Also referred to as the Interim UCONN Wholesale in PURA decision November 2, 2016 • 60% of the approved CT Water Public Authority rates for commodity and basic service charge on the meter at the connection point	University will continue to own and is responsible to operate and maintain/repair the system and any infrastructure within University boundaries
Existing Storrs Customers	**Storrs Rate** • Rate and special charges currently charged by University to off campus customers for existing customers of record as of date CWC begins to serve Storrs customers, including town facilities and hydrants will be maintained	The Storrs Rate shall be subject to adjustment by the same dollar amount change approved by PURA for similarly defined categories of customers in subsequent rate proceedings.
New Storrs Customers	**Connecticut Water Rate** • Any new services or change to customer of record at existing premise after date CWC begins to serve Storrs customers would be at Connecticut Water Year Round customer rates	
All CWC rates and charges are subject to any PURA approved WICA or Water Revenue Adjustment charges or credits in effect at the time of the billing.		

The following rates will be charged for service provided by the University to its customers, as per the Agreement.

Customers Served by the University	**University Rate** • Rates and charges as approved by the University Board of Trustees.

X. UTILITY BILLING WITH NET VOLUME CALCULATION

The project is designed for Connecticut Water to provide water to the University system at the “Delivery Point”. Water will move through the University system to serve the ‘off campus’ customers of the Storrs System and any needs of the University.

The University will be billed for the Basic Service Charge for the meter at the Delivery Point, commodity charge for the net volume delivered, and is subject to applicable PURA approved surcharges or credits.

As there is no single point where the ‘off campus’ customers start beyond the University system, the usage and payments shall include the Meter Charge at the Delivery Point and will be subject to a “Net Volume” calculation as described below,

“Net Volume” will be calculated as the water delivered by CWC through the meter at the Delivery Point, reduced by:

i) *the total of the volume of metered water delivered by CWC to CWC customers downstream of the Delivery Point, and*

ii) *the volume of metered water delivered to non-university customers in the UConn Technology Park for which the revenues will be transferred by UConn to CWC, and*

iii) *a percentage adjustment established annually by the Parties to reflect a reasonable estimate of the volume of nonrevenue water (e.g. system leaks, fire flows) in the system supplied by CWC downstream of the Delivery Point.*

Sample Net Volume and billing calculations, using rates and charges in effect as of July 1, 2016 are provided below as Exhibit 1 for illustrative purposes. The calculation will be adjusted as rates or charges are modified over time and to reflect actual volumes of water used by the respective utilities.

Meter readings are to be provided by CWC to UConn on a quarterly basis for informational purposes in April, July and October. Final year end invoicing will be based on January meter read with a mid - January billing.

Sample Billing Calculations

Based on billing history, it is estimated that the initial daily demands for the Storrs System customers will be approximately 100,000 gpd and the Agreement stipulates for CWC to provide such water through the interconnection each day to meet those needs, with any additional quantity provided as coordinated with the University.

The following examples are provided for illustrative purposes only to demonstrate how the Net Volume would be calculated. They assume the same amount of water provided by CWC at the Delivery Point and uses different scenarios for the use by Connecticut Water and the University to show the Net Volume Calculation and billing provisions.

Exhibit 1

Example #1 –

CWC Metered Usage for Storrs Customers is less than provided at Delivery Point

1) Water Provided at Delivery Point		**300,000 gals**
2) Water Received by CT Water		
a) Metered Usage for Storrs CWC Customers	100,000 gals	
b) 10% Adjustment for CWC Nonrevenue Water	10,000 gals	
c) Amount sold to private entities in Tech Park	50,000 gals	
TOTAL Water Received by CT Water		**160,000 gals**
3) NET VOLUME Delivered to University		**+140,000 gals**

BILLING Calculation

Net 140,000 gals @ SICR Rate of $3.615/1000 gals =	$ 506.10
60% of CWC Meter Charge @ Delivery Point 10" Meter @ 1242.39/mo	$ 745.43
4" Meter @ 258.79/mo	$ 155.27
Revenue due CWC for private entities in Tech Park	
50,000 gals @ CWC commercial rate @ $6.920	$ 346.00
Meter Charges for those accounts (example only – 2")	$ 248.44
Subtotal subject to Surcharges	*$2001.24*
Surcharges	
WICA @ 5.12%	$ 102.46
WRA @ 2.02%	$ 40.42
TOTAL BILLED to University	**$2144.12**

Example #2 –

CWC Metered Usage for Storrs Customers is more than provided at Delivery Point

1. Water Provided at Delivery Point			**300,000 gals**
2. Water Received by CT Water			
	a. Metered Usage for Storrs CWC Customers	350,000 gals	
	b. 10% Adjustment for CWC Nonrevenue Water	35,000 gals	
	c. Amount sold to private entities in Tech Park	50,000 gals	
	TOTAL Water Received by CT Water		**<u>435,000 gals</u>**
3. NET VOLUME Delivered to University			**-135,000 gals**

BILLING Calculation

Net -135,000 gals @ SICR Rate of $3.615/1000 gals =		$- 488.02
60% of CWC Meter Charge @ Delivery Point	10" Meter @ 1242.39/mo	$ 745.43
	4" Meter @ 258.79/mo	$ 155.27
Revenue due CWC for private entities in Tech Park		
50,000 gals @ CWC commercial rate @ $6.920		$ 346.00
Meter Charges for those accounts (example only – 2")		<u>$ 248.44</u>
Subtotal subject to Surcharges		*$1007.12*
Surcharges		
WICA @ 5.12%		$ 51.56
WRA @ 2.02%		<u>$ 20.34</u>
TOTAL BILLED to University		**$1079.02**

ADDENDUM "A"

DIVERSION PERMIT COMPLIANCE TASKS & SCHEDULES

Permit #DIV201401487

In Effect Until May 29, 2040

Shenipsit Lake Stream Flow Release

a. In order to mitigate potential fisheries impact resulting from the authorized diversion, CT Water shall maintain the current stream flow release of 3.24 cubic feet per second (cfs), with the current spring freshet release as defined in Table L-1 in Attachment L of their application dated April 23, 2014. Such stream flow releases shall be made from the Shenipsit Lake to the Hockanum River immediately downstream of the lake, and

b. Within ten (10) years of the issuance of this permit, CT Water shall make stream flow releases from the Shenipsit Lake fully coincident with Class 3 releases as defined in section 26-141b-6(a)(3) and 26-141b-6(b) of the Regulations of Connecticut State Agencies (RCSA).

c. CT Water may request from the commissioner an extension of time to comply with the releases as defined in section 26-141b-6(a)(3) RCSA. Any such request for a time extension shall be submitted in writing to the commissioner and shall include reasons for such a request, including but not limited to, engineering, financial, permitting, or public health considerations. The commissioner shall have sole discretion to approve or deny such request.

d. CT Water may request an alternative site specific release compatible with the standards of section 26-141b-6(f)(2) of the RCSA.

e. In accordance with commitments made by CT Water in the application, CT Water shall not reduce managed stream flow releases from Shenipsit Lake due to an inadequate water supply margin of safety for the duration of this permit.

Stream Discharge Record Keeping and Reporting

CT Water shall monitor and record the daily discharge to the Hockanum River immediately downstream of the Shenipsit Lake. CT Water shall record the stage reading, the gate opening, the date and time of the reading and the converted flow value at the time of measurement. CT Water shall also record the number of hours elapsed since their discharge to the Hockanum River has fallen below the specified trigger thresholds of the Shenipsit Lake Stream Flow Release requirements. A copy of the daily discharge records shall be included in the Annual Report to the Commissioner.

Metering

CT Water shall measure the total amount of water transferred each day from The Connecticut Water Company water supply system to the Town of Mansfield and the University of Connecticut at the intersection of Route 195 and Towers Loop Road in Mansfield and shall for the duration of this authorization continuously operate and maintain any meters used in such measuring in good working order. In the event of meter malfunction or breakage, CT Water shall repair or replace such meter within 72 hours. CT Water shall submit for the Commissioner's approval a metering plan no later than *60* days prior to the initiation of the diversion.

Meter Calibration

CT Water shall biennially test and calibrate any distribution meter used for measuring the total amount of water transferred each day within two percent accuracy as shown through a post-calibration test. CT Water shall maintain a record of the accuracy and calibration test(s) along with supporting documentation and certifications. CT Water shall make a copy of said records available to the Commissioner or the Commissioner's designee immediately upon request.

Daily Transfer Record

CT Water shall maintain a daily record of the meter readings indicating the total volume of water in gallons transferred from The Connecticut Water Company water system to the Town of Mansfield and the University of Connecticut water supply system that day. The daily record shall also record the time of meter readings and denote and explain any instances in which the diversion of water exceeded the authorized withdrawal limitation(s) specified in this permit. A copy of the daily record of withdrawals shall be included in the Annual Report to the Commissioner.

Leak Detection

Within five years of the issuance of this permit, and every five years thereafter, CT Water and UConn shall complete a system wide comprehensive leak detection survey of the water distribution system and repair any leaks found. The leak detection survey shall follow standards and criteria contained within AWWA Manual M36 as may be amended or revised. A copy of all actions taken pursuant to the leak detection survey, including the number of miles of main surveyed, survey techniques and methodology, leaks found and repairs made shall be included in the Annual Report to the Commissioner.

Long-range Water Conservation Plan

CT Water and UConn shall implement their Long- range Water Conservation Plans, as described in the permittees' application, and in accordance with the permittees' Water Supply Plan as approved pursuant to CGS Section 25-32d and any amendments or updates thereto. CT Water and UConn shall maintain a summary of all actions taken each year pursuant to the Long-range Water Conservation Plan and a description of the estimated or actual water savings achieved. A copy of this summary shall be included in the Annual Report to the Commissioner.

Record Keeping Requirements

Except as provided below, or as otherwise specified in writing by the commissioner, all information required under this permit shall be retained at CT Water's and UConn's principal place of business, or be readily available on request. CT Water shall maintain a copy of this permit on Site at all times during the construction of the pipeline. CT Water and UConn shall retain copies of all records and reports required by this permit; and records of all data used to compile these reports for a period of at least ten years from the date such data was generated or report created, whichever is later.

Annual Reporting

CT Water and UConn shall submit by February 28 of each year, for the duration of this authorization, an Annual Report for the preceding calendar year. The Annual Report shall be certified and shall contain a compilation of the following:

a. A copy of the daily record of stream discharge.;
b. A copy of the records documenting the daily transfer of water from The Connecticut Water Company water system to The University of Connecticut water supply system.;
c. A copy of the leak detection report.;
d. A summary report from CT Water and UConn of all the actions taken pursuant to the Long-Range Water Conservation Plan and Water Conservation Plan and description of actual or estimated water savings achieved,
e. A copy of the list of the number and types of customers connected to the regional pipeline during the prior year; and
f. Denotation and explanation of any instances of violation of the authorized withdrawal limitation(s) or any other condition of this authorization.

New Service Connections

New service connections along the distribution pipeline route from Tolland, or more intensive use of an existing service connection along said route, from water supplied pursuant to this permit shall be limited to only those proposed land uses of an intensity allowed under local plans of conservation and development as of the date of the Connecticut Office of Policy and Managements' notice of Environmental Impact Evaluation sufficiency (September 16, 2013). Connections for users of greater intensity will be allowed only if determination is made by State or local agencies, within their applicable authorities, including but not limited to the Public Utility Regulatory Authority pursuant to Section 16-10 Connecticut General Statutes, that such connection is necessary to address a demonstrated environmental, public health, public safety, economic, social, or general welfare concern. CT Water in coordination with the Mansfield Land Use office shall provide in the annual report a list of the number and types of customers connected to the pipeline during the prior year.

DIVERSION PERMIT

Permit #DIV201401487

In Effect Until May 29, 2040

Diversion Permit.xps

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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JUN 16 2015
OFFICE OF ENVIRONMENTAL POLICY

PERMIT

Permittees: The Connecticut Water Company
93 West Main Street, Clinton CT 06413-0562
Attn: David Radka

The University of Connecticut
31 LeDoyt Road, Unit 3055, Storrs, CT 06269-3055
Attn: Jason Coite

Permit No: DIV-201404187

Town: Ellington, Vernon, Tolland, Coventry, Mansfield

Project: Interconnection and diversion of water from the Connecticut Water Company public water system in Tolland to the University of Connecticut and the Town of Mansfield

Waters: Shenipsit Lake, Hockanum River, Willimantic River

Pursuant to Connecticut General Statutes Section 22a-368, the Commissioner of Energy and Environmental Protection ("Commissioner") hereby grants a permit to The Connecticut Water Company and The University of Connecticut ("the Permittees") to conduct regulated activities associated with the interconnection and transfer of water from the Connecticut Water Company public water system in Tolland to the University of Connecticut and Mansfield. The purpose of said activities is to provide supplemental public water supplies to the University of Connecticut and the Town of Mansfield.

AUTHORIZED ACTIVITY

Specifically, the permittees are authorized to: 1) transfer a maximum of 1.85 million gallons per day of potable water from The Company's Northern Operations Western System to Mansfield and the University of Connecticut's public water system Connecticut Water via a proposed regional 5.3 mile pipeline along Route 195, and 2) installation of a 0.5 mile water distribution main emanating from the aforementioned regional pipeline westerly along Route 44 from Mansfield Four Corners to the vicinity of the Jensen's Mobile Home Park. The location of the regional pipeline and the water distribution main authorized by this permit are referred to as "the Site".

The activities proposed will impact Shenipsit Lake, Hockanum River, and the Willimantic River.

All activities shall be conducted in accordance with plans entitled: "Water Systems and Proposed Improvements / Tolland-Mansfield Regional Pipeline and Interconnection / Tolland, Coventry &

Mansfield, CT," prepared by Milone & MacBroom, dated 12/6/2013, revised through 4/7/2014, submitted as a part of the application.

This authorization constitutes the licenses and approvals required by Section 22a-368 of the Connecticut General Statutes.

This authorization is subject to and does not derogate any present or future property rights or other rights or powers of the State of Connecticut, conveys no property rights in real estate or material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state, or local laws or regulations pertinent to the property or activity affected thereby.

The permittees' failure to comply with the terms and conditions of this permit shall subject the permittees, including the permittees' agents or contractor(s) to enforcement actions and penalties as provided by law.

This authorization is subject to the following conditions:

CONDITIONS:

1. **Expiration.** This permit shall expire on May 29, 2040.

2. **Construction Commencement and Completion.** If construction of any structures or facilities authorized herein is not completed within three years of issuance of this permit or within such other time as may be provided by this permit, or if any activity authorized herein is not commenced within three years of issuance of this permit or within such other time as may be provided by this permit, this permit shall expire three years after issuance or at the end of such time as may be authorized by the Commissioner.

3. **Notification of Project Initiation.** The permittees shall notify the Commissioner in writing two weeks prior to: (A) commencing construction or modification of structures or facilities authorized herein; and (B) initiating the diversion authorized herein.

4. **De minimis Alteration**. For Water Diversion Permits (CGS 22a-368) - The permittees may not make any alterations, except de minimis alterations, to any structure, facility, or activity authorized by this permit unless the permittees apply for and receives a modification of this permit in accordance with the provisions of section 22a-377(c)-2 of the Regulations of Connecticut State Agencies. Except as authorized by subdivision (5) of section 22a-377(b)-1(a) of the Regulations of Connecticut State Agencies, the permittee may not make any de minimis alterations to any structure, facility, or activity authorized by this permit without written permission from the Commissioner. A de minimis alteration means an alteration which does not significantly increase the quantity of water diverted or significantly change the capacity to divert water.

5. **Maintenance of Structures.** All structures, facilities, or activities constructed, maintained, or conducted pursuant hereto shall be consistent with the terms and conditions of this permit, and any structure, facility or activity not specifically authorized by this permit, or exempted pursuant to section 22a-377 of the General Statutes or section 22a-377(b)-1 of the Regulations of Connecticut State Agencies, or otherwise exempt pursuant to other General Statutes, shall constitute a violation hereof which may result in modification, revocation or suspension of this permit or in the institution of other legal proceedings to enforce its terms and conditions.

   Unless the permittees maintain in optimal condition any structures or facilities authorized by this permit, the permittees shall remove such structures and facilities and restore the affected waters to their condition prior to construction of such structures or facilities.

6. **Accuracy of Documentation.** In issuing this permit, the Commissioner has relied on information provided by the permittees. If such information was false, incomplete, or misleading, this permit may be modified, suspended or revoked and the permittees may be subject to any other remedies or penalties provided by law.

7. **Best Management Practices & Notification of Adverse Impact**. In constructing or maintaining any structure or facility or conducting any activity authorized herein, or in removing any such structure or facility under condition 5 hereof, the permittees shall employ best management practices to control storm water discharges, to prevent erosion and sedimentation, and to otherwise prevent pollution of wetlands and other waters of the State. Best Management Practices include, but are not limited, to practices identified in the *Connecticut Guidelines for Soil Erosion and Sediment Control* as revised, *2004 Connecticut Stormwater Quality Manual*, Department of Transportation's *ConnDOT Drainage Manual* as revised, and the Department of Transportation Standard Specifications as revised.

   The permittees shall immediately inform the Commissioner of any adverse impact or hazard to the environment which occurs or is likely to occur as the direct result of the construction, maintenance, or conduct of structures, facilities, or activities authorized herein.

8. **Reporting of Violations.** The permittees shall, no later than 48 hours after the permittees learn of a violation of this permit, report same in writing to the Commissioner. Such report shall contain the following information:

   a. the provision(s) of this permit that has been violated;
   b. the date and time the violation(s) was first observed and by whom;
   c. the cause of the violation(s), if known
   d. if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;

e. if the violation(s) has not ceased, the anticipated date when it will be corrected;
f. steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented;
g. the signatures of the permittee(s) and of the individual(s) responsible for actually preparing such report, each of whom shall certify said report in accordance with condition 12 of this permit.

9. **Material Storage in the Floodplain.** The storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five-hundred (500) year flood is prohibited. Any other material or equipment stored at the site below said elevation by the permittees or the permittees' contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.

10. **Permit Transfer.** This permit is not transferable without the prior written consent of the Commissioner.

11. **Contractor Notification**. The permittees shall give a copy of this permit to the contractor(s) who will be carrying out the activities authorized herein prior to the start of construction and shall receive a written receipt for such copy, signed and dated by such contractor(s). The permittees' contractor(s) shall conduct all operations at the Site in full compliance with this permit and, to the extent provided by law, may be held liable for any violation of the terms and conditions of this permit.

12. **Certification of Documents**. Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this permit shall be signed by the permittees or a responsible corporate officer of the permittees, a general partner of the permittees, and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement in the submitted information may be punishable as a criminal offense in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b and in accordance with any other applicable statute."

13. **Submission of Documents**. Any document or notice required to be submitted to the Commissioner under this permit shall, unless otherwise specified in writing by the Commissioner, be directed to:

    Director, Inland Water Resources Division
    Department of Energy and Environmental Protection
    79 Elm Street
    Hartford, CT 06106-5127

    The date of submission to the Commissioner of any document required by this permit shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this permit, including but not limited to notice of approval or disapproval on any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means any calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

14. **Rights.** This permit is subject to and does not derogate any rights or powers of the State of Connecticut, conveys no property rights or exclusive privileges, and is subject to all public and private rights and to all applicable federal, state, and local law. In constructing or maintaining any structure or facility or conducting any activity authorized herein, the permittees may not cause pollution, impairment, or destruction of the air, water, or other natural resources of this State. The issuance of this permit shall not create any presumption that this permit should be renewed.

15. **Shenipsit Lake Stream Flow Release.**
    a. In order to mitigate potential fisheries impact resulting from the authorized diversion, the permittees shall maintain the current stream flow release of 3.24 cubic feet per second (cfs), with the current spring freshet release as defined in Table L-1 in Attachment L of their application dated April 23, 2014. Such stream flow releases shall be made from the Shenipsit Lake to the Hockanum River immediately downstream of the lake, and
    b. Within ten (10) years of the issuance of this permit, the permittees shall make stream flow releases from the Shenipsit Lake fully coincident with Class 3 releases as defined in section 26-141b-6(a)(3) and 26-141b-6(b) of the Regulations of Connecticut State Agencies (RCSA).
    c. The permittees may request from the commissioner an extension of time to comply with the releases as defined in section 26-141b-6(a)(3) RCSA. Any such request for a time extension shall be submitted in writing to the commissioner and shall include reasons for such a request, including but not limited to, engineering,

financial, permitting, or public health considerations. The commissioner shall have sole discretion to approve or deny such request.

d. The permittees may request an alternative site specific release compatible with the standards of section 26-141b-6(f)(2) of the RCSA.

e. In accordance with commitments made by the permittees in the application, the permittees shall not reduce managed stream flow releases from Shenipsit Lake due to an inadequate water supply margin of safety for the duration of this permit.

16. Stream Discharge Record Keeping and Reporting. The permittees shall monitor and record the daily discharge to the Hockanum River immediately downstream of the Shenipsit Lake. The permittees shall record the stage reading, the gate opening, the date and time of the reading and the converted flow value at the time of measurement. The permittees shall also record the number of hours elapsed since their discharge to the Hockanum River has fallen below the specified trigger thresholds as required in Condition #15. A copy of the daily discharge records shall be included in the Annual Report to the Commissioner required by Condition #23 of this permit.

17. Metering. The permittees shall measure the total amount of water transferred each day from The Connecticut Water Company water supply system to the Town of Mansfield and the University of Connecticut at the intersection of Route 195 and Towers Loop Road in Mansfield and shall for the duration of this authorization continuously operate and maintain any meters used in such measuring in good working order. In the event of meter malfunction or breakage, the permittees shall repair or replace such meter within 72 hours. The permittees shall submit for the Commissioner's approval a metering plan no later than 60 days prior to the initiation of the diversion.

18. Meter Calibration. The permittees shall biennially test and calibrate any distribution meter used for measuring the total amount of water transferred each day within two percent accuracy as shown through a post-calibration test. The permittees shall maintain a record of the accuracy and calibration test(s) along with supporting documentation and certifications. The permittees shall make a copy of said records available to the Commissioner or the Commissioner's designee immediately upon request.

19. Daily Transfer Record. The permittees shall maintain a daily record of the meter readings indicating the total volume of water in gallons transferred from The Connecticut Water Company water system to the Town of Mansfield and the University of Connecticut water supply system that day. The daily record shall also record the time of meter readings and denote and explain any instances in which the diversion of water exceeded the authorized withdrawal limitation(s) specified in this permit. A copy of the daily record of withdrawals shall be included in the Annual Report to the Commissioner required by Condition #23 of this permit.

20. **Leak Detection**. Within five years of the issuance of this permit, and every five years thereafter, the permittees shall complete a system wide comprehensive leak detection survey of the water distribution system and repair any leaks found. The leak detection survey shall follow standards and criteria contained within AWWA Manual M36 as may be amended or revised. A copy of all actions taken pursuant to the leak detection survey, including the number of miles of main surveyed, survey techniques and methodology, leaks found and repairs made shall be included in the Annual Report to the Commissioner required by Condition #23 of this permit.

21. **Long-range Water Conservation Plan**. The permittees shall implement their Long-range Water Conservation Plans, as described in the permittees' application, and in accordance with the permittees' Water Supply Plan as approved pursuant to CGS Section 25-32d and any amendments or updates thereto. The permittees shall maintain a summary of all actions taken each year pursuant to the Long-range Water Conservation Plan and a description of the estimated or actual water savings achieved. A copy of this summary shall be included in the Annual Report to the Commissioner required by Condition #23 of this permit.

22. **Record Keeping Requirements**. Except as provided below, or as otherwise specified in writing by the commissioner, all information required under this permit shall be retained at the permittees' principal place of business, or be readily available on request. The permittees shall maintain a copy of this permit on Site at all times during the construction of the pipeline. The permittees shall retain copies of all records and reports required by this permit; and records of all data used to compile these reports for a period of at least ten years from the date such data was generated or report created, whichever is later.

23. **Annual Reporting**. The permittees shall submit by February 28 of each year, for the duration of this authorization, an Annual Report for the preceding calendar year. The Annual Report shall be certified in accordance with Condition #12 of this permit and shall contain a compilation of the following:
    a. A copy of the daily record of stream discharge as required by Condition #16 of this permit;
    b. A copy of the records documenting the daily transfer of water from The Connecticut Water Company water system to The University of Connecticut water supply system as required by Condition #29 of this permit;
    c. A copy of the leak detection report as required by Condition #20 of this permit;
    d. A summary report from each permittee of all the actions taken pursuant to the Long-Range Water Conservation Plan and Water Conservation Plan and description of actual or estimated water savings achieved, as required by Condition #21 of this permit;
    e. A copy of the list of the number and types of customers connected to the regional pipeline during the prior year as required by Condition #26; and

f. Denotation and explanation of any instances of violation of the authorized withdrawal limitation(s) or any other condition of this authorization.

24. **Wood Turtle Conservation**. To limit the potential for impacts to Wood Turtles (a Connecticut species of special concern) at locations as indicated on Figure 4-3 of Attachment D-4 of the permittees' application, project construction activities should be restricted to the turtles' dormant period of November 1 to April 1 at said locations. If work must be done during the turtle's active period of April 1 to November 1 at said locations, the permittee shall adhere to the following precautionary measures:

- silt fencing shall be installed around the appropriate work area prior to construction,
- work crews shall be apprised of the species description and possible presence prior to construction,
- work crews shall search the work area for wood turtles each day prior to construction,
- any wood turtles encountered during the work shall be moved unharmed to an area immediately outside of the fenced work area and oriented in the same direction it was walking when found,
- all precautionary measures should be taken to avoid degradation to wetland habitats including any wet meadows and seasonal pools,
- work conducted in these habitats during the early morning and evening hours should occur with special care not to harm basking or foraging individuals,
- no heavy machinery or vehicles shall be parked in any turtle habitat and precautions shall be taken when the machinery is traveling to the work area to avoid turtles,
- work conducted during the early morning and evening hours shall occur with special care not to harm basking or foraging individuals, and
- all silt fencing shall be removed after work is completed when soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.

Refer to the attached fact sheet for species and habitat description.

25. **Southern Bog Lemming Conservation.** Work crews shall be apprised of the species description, habitat and possible presence of the Southern Bog Lemming, at locations as indicated on Figure 4-3 of Attachment D-4 of the permittees' application, prior to construction. Refer to the attached fact sheet for species and habitat description.

26. **New Service Connections.** New service connections along the distribution pipeline route from Tolland, or more intensive use of an existing service connection along said route, from water supplied pursuant to this permit shall be limited to only those proposed land uses of an intensity allowed under local plans of conservation and development as of the

date of the Connecticut Office of Policy and Managements' notice of Environmental Impact Evaluation sufficiency (September 16, 2013). Connections for users of greater intensity will be allowed only if determination is made by State or local agencies, within their applicable authorities, including but not limited to the Public Utility Regulatory Authority pursuant to Section 16-10 Connecticut General Statutes, that such connection is necessary to address a demonstrated environmental, public health, public safety, economic, social, or general welfare concern. The permittees shall provide in the annual report as, required by Condition #23 of this permit, a list of the number and types of customers connected to the pipeline during the prior year.

Issued by the Commissioner of Energy and Environmental Protection on:

6/29/15
Date

Robert Klee
Commissioner

ADDENDUM “B”

Water Quality Monitoring and Compliance Schedules
CWC Northern Reg - Western System (CT0473011)
University of Connecticut System (CT0780021)

UCONN WQMS.xps

Connecticut Department of Public Health Drinking Water Section
Water Quality Monitoring and Compliance Schedule

PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	UNIVERSITY OF CONNECTICUT - MAIN CAMPUS	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Monitoring Requirements

Water System Facility: **DISTRIBUTION SYSTEM (WSF ID: 00600)**

Asbestos (1094) — **2 routine (RT) per nine years**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
WILLOW HOUSE DAYCR (UCDEP-4)	1/1/14 - 12/31/22		
FACILITIES OPS BLDG (UCMC-5)	1/1/14 - 12/31/22		

Total Coliform (3100) — **10 routine (RT) per month**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
Select from Inventory of Active Sampling Points	7/1/17 - 7/31/17		Complete

Total Coliform (3100) — **30 routine (RT) per month**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
Select from Inventory of Active Sampling Points	8/1/17 - 8/31/17		Complete
	9/1/17 - 9/30/17		
	10/1/17 - 10/31/17		Complete
	11/1/17 - 11/30/17		
	12/1/17 - 12/31/17		
	1/1/18 - 1/31/18		

Disinfectant Byproducts - TTHM & HAA5 (DBP) — **4 routine (RT) per quarter**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
DISCOVERY DEPOT DC. (UCDEP-3)	4/1/17 - 6/30/17	6/1-6/30	Complete
	7/1/17 - 9/30/17	9/1-9/30	Complete
	10/1/17 - 12/31/17	12/1-12/31	
	1/1/18 - 3/31/18	3/1-3/31	
	4/1/18 - 6/30/18	6/1-6/30	
303 MAPLE ROAD (UCMC-4)	4/1/17 - 6/30/17	6/1-6/30	Complete
	7/1/17 - 9/30/17	9/1-9/30	Complete
	10/1/17 - 12/31/17	12/1-12/31	
	1/1/18 - 3/31/18	3/1-3/31	
	4/1/18 - 6/30/18	6/1-6/30	
HILLTOP APTS COMMUNITY CENTER (UCMC-6)	4/1/17 - 6/30/17	6/1-6/30	Complete
	7/1/17 - 9/30/17	9/1-9/30	Complete
	10/1/17 - 12/31/17	12/1-12/31	
	1/1/18 - 3/31/18	3/1-3/31	
	4/1/18 - 6/30/18	6/1-6/30	
EH&S (UCMC-7)	4/1/17 - 6/30/17	6/1-6/30	Complete
	7/1/17 - 9/30/17	9/1-9/30	Complete
	10/1/17 - 12/31/17	12/1-12/31	
	1/1/18 - 3/31/18	3/1-3/31	
	4/1/18 - 6/30/18	6/1-6/30	

Lead And Copper (PBCU) — **30 routine (RT) per three years**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
Select from Inventory of Active Sampling Points	1/1/15 - 12/31/17	6/1-9/30	Complete

NOTE: This information has been provided to help owners and operators of public water systems maintain compliance with drinking water quality monitoring requirements. Any inaccuracies contained herein will not relieve the owner or operator of the requirement to maintain compliance with the applicable regulations.

Connecticut Department of Public Health Drinking Water Section
Water Quality Monitoring and Compliance Schedule

PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	UNIVERSITY OF CONNECTICUT - MAIN CAMPUS	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Monitoring Requirements

Water System Facility: DISTRIBUTION SYSTEM (WSF ID: 00600)

Lead And Copper (PBCU) — **30 routine (RT) per three years**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
	1/1/18 - 12/31/20	6/1-9/30	

Physical Parameters (PPS) — **30 routine (RT) per month**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
Select from Inventory of Active Sampling Points	8/1/17 - 8/31/17		Complete
	9/1/17 - 9/30/17		
	10/1/17 - 10/31/17		Complete
	11/1/17 - 11/30/17		
	12/1/17 - 12/31/17		
	1/1/18 - 1/31/18		

Physical Parameters (PPS) — **10 routine (RT) per month**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
Select from Inventory of Active Sampling Points	7/1/17 - 7/31/17		Complete

Water System Facility: ENTRY POINT - FENTON RIVER WELLFIELD (WSF ID: 00701)

Net Gross Alpha (4000) — **1 routine (RT) per three years**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
EP - FENTON (3)	1/1/17 - 12/31/19		
	1/1/20 - 12/31/22		

Uranium (4006) — **1 routine (RT) per three years**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
EP - FENTON (3)	1/1/17 - 12/31/19		
	1/1/20 - 12/31/22		

Combined Radium-226/228 (4010) — **1 routine (RT) per three years**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
EP - FENTON (3)	1/1/17 - 12/31/19		
	1/1/20 - 12/31/22		

Inorganic Chemicals (IOCS) — **1 routine (RT) per three years**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
EP - FENTON (3)	1/1/17 - 12/31/19		
	1/1/20 - 12/31/22		

Nitrate And Nitrite (NOX) — **1 routine (RT) per year**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
EP - FENTON (3)	1/1/16 - 12/31/16		Complete
	1/1/17 - 12/31/17		
	1/1/18 - 12/31/18		

Pesticides, Herbicides and PCBs - Phase II & V (SOCS) — **2 routine (RT) per three years**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
EP - FENTON (3)	1/1/17 - 12/31/19		
	1/1/20 - 12/31/22		

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Connecticut Department of Public Health Drinking Water Section
Water Quality Monitoring and Compliance Schedule

PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	UNIVERSITY OF CONNECTICUT - MAIN CAMPUS	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Monitoring Requirements

Water System Facility: ENTRY POINT - FENTON RIVER WELLFIELD (WSF ID: 00701)

Organic Chemicals (VOCS) — **1 routine (RT) per year**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
EP - FENTON (3)	1/1/16 - 12/31/16		Complete
	1/1/17 - 12/31/17		
	1/1/18 - 12/31/18		

Water System Facility: WILLIMANTIC WELLFIELD TREATMENT PLANT (WSF ID: 00702)

Inorganic Chemicals (IOCS) — **1 routine (RT) per three years**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
ENTRY POINT - WILLIMANTIC TP (3)	1/1/15 - 12/31/17		
	1/1/18 - 12/31/20		

Nitrate And Nitrite (NOX) — **1 routine (RT) per year**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
ENTRY POINT - WILLIMANTIC TP (3)	1/1/16 - 12/31/16		Complete
	1/1/17 - 12/31/17		
	1/1/18 - 12/31/18		

Radionuclides - Gross Alpha, Combined Radium & Uranium (RADA) — **1 routine (RT) per three years**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
ENTRY POINT - WILLIMANTIC TP (3)	1/1/17 - 12/31/19		
	1/1/20 - 12/31/22		

Pesticides, Herbicides and PCBs - Phase II & V (SOCS) — **2 routine (RT) per three years**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
ENTRY POINT - WILLIMANTIC TP (3)	1/1/17 - 12/31/19		
	1/1/20 - 12/31/22		

Organic Chemicals (VOCS) — **1 routine (RT) per year**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
ENTRY POINT - WILLIMANTIC TP (3)	1/1/16 - 12/31/16		Complete
	1/1/17 - 12/31/17		
	1/1/18 - 12/31/18		

Water System Facility: FENTON RIVER - WELL B (WSF ID: 1322)

E. Coli (3014) — **1 routine (RT) per month**

Sampling Point (Sampling Point ID)	Monitoring Period	Collection Period	Compliance Status
FENTON RIVER WELL B (2)	7/1/17 - 7/31/17		Complete
	8/1/17 - 8/31/17		Complete
	9/1/17 - 9/30/17		Complete
	10/1/17 - 10/31/17		Complete
	11/1/17 - 11/30/17		
	12/1/17 - 12/31/17		
	1/1/18 - 1/31/18		

Water System Facility: FENTON RIVER - WELL C (WSF ID: 1323)

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PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	**UNIVERSITY OF CONNECTICUT - MAIN CAMPUS**	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Monitoring Requirements

Water System Facility: **FENTON RIVER - WELL C (WSF ID: 1323)**

E. Coli (3014) — **1 routine (RT) per month**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
FENTON RIVER WELL C (2)	7/1/17 - 7/31/17		Complete
	8/1/17 - 8/31/17		Complete
	9/1/17 - 9/30/17		Complete
	10/1/17 - 10/31/17		Complete
	11/1/17 - 11/30/17		
	12/1/17 - 12/31/17		
	1/1/18 - 1/31/18		

Water System Facility: **FENTON RIVER - WELL D (WSF ID: 1324)**

E. Coli (3014) — **1 routine (RT) per month**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
FENTON RIVER WELL D (2)	7/1/17 - 7/31/17		Complete
	8/1/17 - 8/31/17		Complete
	9/1/17 - 9/30/17		Complete
	10/1/17 - 10/31/17		Complete
	11/1/17 - 11/30/17		
	12/1/17 - 12/31/17		
	1/1/18 - 1/31/18		

Water System Facility: **WILLIMANTIC WELLFIELD - WELL 1 (WSF ID: 1461)**

E. Coli (3014) — **1 routine (RT) per month**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
UCONN - WELL 1 (2)	7/1/17 - 7/31/17		Complete
	8/1/17 - 8/31/17		Complete
	9/1/17 - 9/30/17		Complete
	10/1/17 - 10/31/17		Complete
	11/1/17 - 11/30/17		
	12/1/17 - 12/31/17		
	1/1/18 - 1/31/18		

Water System Facility: **WILLIMANTIC WELLFIELD - WELL 2 (WSF ID: 1462)**

E. Coli (3014) — **1 routine (RT) per month**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
UCONN - WELL 2 (2)	7/1/17 - 7/31/17		Complete
	8/1/17 - 8/31/17		Complete
	9/1/17 - 9/30/17		Complete
	10/1/17 - 10/31/17		Complete
	11/1/17 - 11/30/17		
	12/1/17 - 12/31/17		
	1/1/18 - 1/31/18		

Water System Facility: **WILLIMANTIC WELLFIELD - WELL 3 (WSF ID: 1463)**

Connecticut Department of Public Health Drinking Water Section
Water Quality Monitoring and Compliance Schedule

PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	**UNIVERSITY OF CONNECTICUT - MAIN CAMPUS**	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Monitoring Requirements

Water System Facility: **WILLIMANTIC WELLFIELD - WELL 3 (WSF ID: 1463)**

E. Coli (3014) — **1 routine (RT) per month**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
UCONN - WELL 3 (2)	7/1/17 - 7/31/17		Complete
	8/1/17 - 8/31/17		Complete
	9/1/17 - 9/30/17		Complete
	10/1/17 - 10/31/17		Complete
	11/1/17 - 11/30/17		
	12/1/17 - 12/31/17		
	1/1/18 - 1/31/18		

Water System Facility: **WILLIMANTIC WELLFIELD - WELL 4 (WSF ID: 1464)**

E. Coli (3014) — **1 routine (RT) per month**

Sampling Point (Sampling Point ID)	*Monitoring Period*	*Collection Period*	*Compliance Status*
UCONN - WELL 4 (2)	7/1/17 - 7/31/17		Complete
	8/1/17 - 8/31/17		Complete
	9/1/17 - 9/30/17		Complete
	10/1/17 - 10/31/17		Complete
	11/1/17 - 11/30/17		
	12/1/17 - 12/31/17		
	1/1/18 - 1/31/18		

Monthly Water System Facility (WSF) Level Monitoring Requirements

Water System Facility: **ENTRY POINT - FENTON RIVER WELLFIELD (WSFID: 00701)**

Analyte	Monitoring Requirement (Summary Type)	Operating Limit	Samples Req/Month
Chlorine	Entry Point Chlorine Residual Monitoring (CHLR)	Minimum: 0.2 MG/L	Daily

Start Date: 12/1/2003

Compliance History: Monitoring Period	Operating Limit Compliance Status:	Monitoring Compliance Status:
7/1/2017 - 7/31/2017		N
8/1/2017 - 8/31/2017		N
9/1/2017 - 9/30/2017		N
10/1/2017 - 10/31/2017		N
11/1/2017 - 11/30/2017		
12/1/2017 - 12/31/2017		

Analyte	Monitoring Requirement (Summary Type)	Operating Limit	Samples Req/Month
pH	Entry Point pH Monitoring (PHRD)	Minimum: 7.0 PH	Daily

Start Date: 12/1/2003

Compliance History: Monitoring Period	Operating Limit Compliance Status:	Monitoring Compliance Status:
7/1/2017 - 7/31/2017		N
8/1/2017 - 8/31/2017		N
9/1/2017 - 9/30/2017		N
10/1/2017 - 10/31/2017		N

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Connecticut Department of Public Health Drinking Water Section
Water Quality Monitoring and Compliance Schedule

PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	UNIVERSITY OF CONNECTICUT - MAIN CAMPUS	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Water System Facility: ENTRY POINT - FENTON RIVER WELLFIELD (WSFID: 00701)

Analyte	Monitoring Requirement (Summary Type)	Operating Limit	Samples Req/Month
pH	Entry Point pH Monitoring (PHRD)	Minimum: 7.0 PH	Daily

Start Date: 12/1/2003

Compliance History: Monitoring Period	Operating Limit Compliance Status:	Monitoring Compliance Status:
11/1/2017 - 11/30/2017		
12/1/2017 - 12/31/2017		

Water System Facility: WILLIMANTIC WELLFIELD TREATMENT PLANT (WSFID: 00702)

Analyte	Monitoring Requirement (Summary Type)	Operating Limit	Samples Req/Month
Chlorine	Entry Point Chlorine Residual Monitoring (CHLR)	Minimum: 0.5 MG/L	Daily

Start Date: 3/1/2013

Compliance History: Monitoring Period	Operating Limit Compliance Status:	Monitoring Compliance Status:
7/1/2017 - 7/31/2017		N
8/1/2017 - 8/31/2017		N
9/1/2017 - 9/30/2017		N
10/1/2017 - 10/31/2017		N
11/1/2017 - 11/30/2017		
12/1/2017 - 12/31/2017		

Analyte	Monitoring Requirement (Summary Type)	Operating Limit	Samples Req/Month
pH	Entry Point pH Monitoring (PHRD)	Minimum: 7.0 PH	Daily

Start Date: 3/1/2013

Compliance History: Monitoring Period	Operating Limit Compliance Status:	Monitoring Compliance Status:
7/1/2017 - 7/31/2017		N
8/1/2017 - 8/31/2017		N
9/1/2017 - 9/30/2017		N
10/1/2017 - 10/31/2017		N
11/1/2017 - 11/30/2017		
12/1/2017 - 12/31/2017		

Other Compliance Schedules

Compliance Schedule Activity	*Due Date*	*Achieved Date*
SUBMIT LEAD CONSUMER NOTICE CERTIFICATE	12/29/2011	
SUBMIT LEAD CONSUMER NOTICE CERTIFICATE	12/29/2017	
CROSS CONNECTION SURVEY REPORT	3/1/2018	
SUBMIT CCR TO THE DEPARTMENT	6/30/2018	
SUBMIT CCR CERTIFICATION FORM	8/9/2018	

Water System Facility and Sampling Point Inventory

Water System Facility ID	*Water System Facility*	*Sampling Point ID*	*Sampling Point Description*	*Status*	*Total Coliform Rule*	*Lead and Copper Rule Tier*	*Asbestos*	*Stage 2 DBPR*
00600	DISTRIBUTION SYSTEM	4	DISTRIBUTION SYSTEM	A	Y			
		DOWNSTREAM	WITHIN 5 SERVICE CON	A				
		UCDEP-1	DEPT RES LIFE MAINT	A	Y	N		

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Connecticut Department of Public Health Drinking Water Section
Water Quality Monitoring and Compliance Schedule

PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	**UNIVERSITY OF CONNECTICUT - MAIN CAMPUS**	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Water System Facility and Sampling Point Inventory

Water System Facility ID	*Water System Facility*	*Sampling Point ID*	*Sampling Point Description*	*Status*	*Total Coliform Rule*	*Lead and Copper Rule Tier*	*Asbestos*	*Stage 2 DBPR*
		UCDEP-10	1340 STAFFORD RD	A		3		
		UCDEP-2	LONGLEY SCHOOL	A	Y	N		
		UCDEP-3	DISCOVERY DEPOT DC.	I	Y			
		UCDEP-4	WILLOW HOUSE DAYCR	I	Y		Y	
		UCDEP-5	KENNEDY BLDG	A	Y	N	Y	
		UCDEP-6	64 SPRING MANOR LN	A		3		
		UCDEP-7	86 SPRING MANOR LN	A	Y	3		
		UCDEP-8	104 SPRING MANOR LN	A	Y	3		
		UCDEP-9	NORLING	A		N		
		UCMC-1	VISITORS CENTER	A	Y	N		
		UCMC-10	NORTH DINING HALL	A	Y	N		
		UCMC-11	STUDENT UNION	A	Y	N		
		UCMC-12	COOP	A	Y	N		
		UCMC-13	10 SOUTH EAGLEVILLE	I	Y			
		UCMC-14	9 DOG LA UNIT 108	I	Y			
		UCMC-15	9 DOG LA UNIT 109	I	Y			
		UCMC-16	11 DOG LANE	I	Y			
		UCMC-17	DAILY CAMPUS	I	Y			
		UCMC-18	41/42 HORSEBARN HILL	A		3		
		UCMC-19	43/44 HORSEBARN HILL	A		3		
		UCMC-2	NATHAN HALE	A	Y	N		
		UCMC-20	9 OAK HILL RD	A		3		
		UCMC-21	1310 STORRS RD	A		3		
		UCMC-22	1332 STORRS RD	A		3		
		UCMC-23	HIGH HEAD	A	Y	N		
		UCMC-24	TOWERS COMM CTR	A		N		
		UCMC-25	CHARTER OAK COMM CTR	A	Y	N		
		UCMC-26	2 N EAGLEVILLE RD	A		3		
		UCMC-27	4 MOULTON RD	A		3		
		UCMC-28	26 OAK HILL	A	Y	3		
		UCMC-29	1 HILLSIDE	A	Y	3		
		UCMC-3	DAIRY BAR	A	Y	N		
		UCMC-30	GRANGE HALL	A	Y	N		
		UCMC-31	HICKS HALL	A	Y	N		
		UCMC-33	WATSON HALL	A		N		
		UCMC-34	SHAKESPEARE BLDG	A	Y	N		
		UCMC-35	BELDON HALL	A	Y	N		
		UCMC-36	EDDY HALL	A	Y	N		

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Connecticut Department of Public Health Drinking Water Section
Water Quality Monitoring and Compliance Schedule

PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	UNIVERSITY OF CONNECTICUT - MAIN CAMPUS	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Water System Facility and Sampling Point Inventory

Water System Facility ID	Water System Facility	Sampling Point ID	Sampling Point Description	Status	Total Coliform Rule	Lead and Copper Rule Tier	Asbestos	Stage 2 DBPR
		UCMC-37	HOLLISTER BLDG	A	Y	N		
		UCMC-38	CHANDLER BLDG	A	Y	N		
		UCMC-39	KINGSTON HALL	A	Y	N		
		UCMC-4	303 MAPLE ROAD	I	Y			
		UCMC-40	SHERMAN HALL	A	Y	N		
		UCMC-41	ALSOP HALL	A		N		
		UCMC-42	BROCK HALL	A		N		
		UCMC-43	BEECHER HALL	A		N		
		UCMC-44	SOUTH CHILLER	A		N		
		UCMC-45	LANDSCAPE BUILDING	A		N		
		UCMC-46	KELLOG BARN	A	Y	N		
		UCMC-47	POULTY OFFICE	A		N		
		UCMC-5	FACILITIES OPS BLDG	A	Y	N	Y	
		UCMC-6	HILLTOP APTS COMMUNI	A	Y	N		Y
		UCMC-7	EH&S	A	Y	N		Y
		UCMC-8	CUP	A	Y	N		
		UCMC-9	SOUTH DINING HALL	A	Y	N		
		UPSTREAM	WITHIN 5 SERVICE CON	A				
00701	ENTRY POINT - FENTON RIVER WELLFIELD	3	EP - FENTON	A				
00702	WILLIMANTIC WELLFIELD TREATMENT PLANT	3	ENTRY POINT - WILLIM	A				
1322	FENTON RIVER - WELL B	2	FENTON RIVER WELL B	A				
1323	FENTON RIVER - WELL C	2	FENTON RIVER WELL C	A				
1324	FENTON RIVER - WELL D	2	FENTON RIVER WELL D	A				
1461	WILLIMANTIC WELLFIELD - WELL 1	2	UCONN - WELL 1	A				
1462	WILLIMANTIC WELLFIELD - WELL 2	2	UCONN - WELL 2	A				
1463	WILLIMANTIC WELLFIELD - WELL 3	2	UCONN - WELL 3	A				
1464	WILLIMANTIC WELLFIELD - WELL 4	2	UCONN - WELL 4	A				
147A	FENTON RIVER WELLFIELD TREATMENT PLANT							
32795	FENTON RIVER WELLFIELD CLEARWELL							
32807	TOWERS STANDPIPE #1 WEST							
37100	BONE MILL ROAD TANK							

NOTE: This information has been provided to help owners and operators of public water systems maintain compliance with drinking water quality monitoring requirements. Any inaccuracies contained herein will not relieve the owner or operator of the requirement to maintain compliance with the applicable regulations.

Connecticut Department of Public Health Drinking Water Section
Water Quality Monitoring and Compliance Schedule

PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	UNIVERSITY OF CONNECTICUT - MAIN CAMPUS	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Water System Facility and Sampling Point Inventory

Water System Facility ID	Water System Facility	Sampling Point ID	Sampling Point Description	Status	Total Coliform Rule	Lead and Copper Rule Tier	Asbestos	Stage 2 DBPR
37102	CORRECTIONAL FACILITY TANK							
45549	5.4 MG TOWERS BASIN							
52038	FENTON RIVER WELLFIELD PUMP STATION							
52040	TOWERS LOOP PUMP STATION							
53803	HIGH HEAD PUMP STATION							
60339	TOWERS STANDPIPE #2 (EAST)							

Certified Operator Information

Water System Facility: **DISTRIBUTION SYSTEM (WSF ID: 00600)**

Facility Classification: CLASS 2 DISTRIBUTION SYSTEM

Operator Name	Operator Type	Certification(s)	Certification Expiration
BUHLER, BRANT D.	CHIEF OPERATOR	DISTRIBUTION SYSTEM OPERATOR - CLASS III	6/30/2019
		WATER TREATMENT PLANT OPERATOR - CLASS II	12/31/2019
DOWLING, THOMAS F.	ASSIGNED OPERATOR	WATER TREATMENT PLANT OPERATOR - CLASS I	9/30/2020
		DISTRIBUTION SYSTEM OPERATOR - CLASS II	6/30/2018

Water System Facility: **FENTON RIVER WELLFIELD TREATMENT PLANT (WSF ID: 147A)**

Facility Classification: CLASS 1 TREATMENT PLANT

Operator Name	Operator Type	Certification(s)	Certification Expiration
BUHLER, BRANT D.	CHIEF OPERATOR	DISTRIBUTION SYSTEM OPERATOR - CLASS III	6/30/2019
		WATER TREATMENT PLANT OPERATOR - CLASS II	12/31/2019
DOWLING, THOMAS F.	ASSIGNED OPERATOR	WATER TREATMENT PLANT OPERATOR - CLASS I	9/30/2020
		DISTRIBUTION SYSTEM OPERATOR - CLASS II	6/30/2018

Water System Facility: **WILLIMANTIC WELLFIELD TREATMENT PLANT (WSF ID: 00702)**

Facility Classification: CLASS 1 TREATMENT PLANT

Operator Name	Operator Type	Certification(s)	Certification Expiration
BUHLER, BRANT D.	CHIEF OPERATOR	DISTRIBUTION SYSTEM OPERATOR - CLASS III	6/30/2019
		WATER TREATMENT PLANT OPERATOR - CLASS II	12/31/2019
DOWLING, THOMAS F.	ASSIGNED OPERATOR	WATER TREATMENT PLANT OPERATOR - CLASS I	9/30/2020
		DISTRIBUTION SYSTEM OPERATOR - CLASS II	6/30/2018

Contact Information

Name	Organization	Job Title
Mr. Stanley Nolan	University of Connecticut	Director of Util.

Mailing Address Line One	Mailing Address Line Two	City	State	Zip Code
25 Ledoyt Road	Unit 3252	Storrs	CT	06269-3252

Business Phone	Extension	Fax	Mobile Phone	Emergency Phone	Email Address
860-486-3208				860-234-2415	stanley.nolan@uconn.edu

Contact Role(s): **Administrative Contact**

NOTE: This information has been provided to help owners and operators of public water systems maintain compliance with drinking water quality monitoring requirements. Any inaccuracies contained herein will not relieve the owner or operator of the requirement to maintain compliance with the applicable regulations.

Connecticut Department of Public Health Drinking Water Section
Water Quality Monitoring and Compliance Schedule

PWS ID	PWS Name	Classification	Population	Owner Type	Primary Source
CT0780021	**UNIVERSITY OF CONNECTICUT - MAIN CAMPUS**	C	28,480	S	GW

Local Address (where applicable)	Service Connections	Residential	Commercial	Industrial	Combined	Agricultural
		350				

Towns Served: MANSFIELD

Name	Organization	Job Title
Mr. Scott Jordan	University of Connecticut	Exec Vp Admin & Cfo

Mailing Address Line One	Mailing Address Line Two	City	State	Zip Code
352 Mansfield Road	Unit 1122	Mansfield	CT	06269-1122

Business Phone	Extension	Fax	Mobile Phone	Emergency Phone	Email Address
860-486-3455					Scott.jordan@uconn.edu

Contact Role(s): **Legal Contact, Owner**

Please note the following:

1. The residual disinfectant concentration must be measured at the same location and time as each total coliform sample.
2. If a Collection Period is specified, all water quality samples must be collected during the specified period.
3. Depending on results, additional monitoring may be required (i.e. repeat or confirmation samples). This schedule is subject to change, and any related correspondence sent by the DWS on or after the generation date of this schedule will have precedence over what is contained in this schedule.

If you have any questions, please contact the Drinking Water Section at (860) 509-7333.

http://www.ct.gov/dph/publicdrinkingwater

End of schedule

NOTE: This information has been provided to help owners and operators of public water systems maintain compliance with drinking water quality monitoring requirements. Any inaccuracies contained herein will not relieve the owner or operator of the requirement to maintain compliance with the applicable regulations.

ADDENDUM "C"

SALE OF EXCESS WATER PERMIT

0524_001.xps

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

Jewel Mullen, M.D., M.P.H., M.P.A.
Commissioner

Dannel P. Malloy
Governor
Nancy Wyman
Lt. Governor

RECEIVED
JAN 16 2015
OFFICE OF ENVIRONMENTAL POLICY

January 14, 2015

Mr. David Radka
Director of Water Resources and Planning
The Connecticut Water Company
93 West Main Street, Clinton, CT 06413

Re: Sale of Excess Water (SEW) Permit #2015-01R: Routine supplemental bulk sale of excess water from The Connecticut Water Company (CT0473011) to the University of Connecticut (CT0780011)

Dear Mr. Radka:

Enclosed is an authorized ten (10) year permit for supplemental sales of excess water from the Connecticut Water Company (CWC) to the University of Connecticut. The permit authorizes sales up to 1.5 MGD on a daily, monthly, and/or yearly basis pursuant to a legal contract between the parties. The approval is granted in recognition of the CWC's commitment to construct a new 9.0 MGD water treatment plant at Lake Shenipsit and the results of the DPH's revised water supply adequacy evaluation that is predicated on the construction of said plant. The DPH's evaluation results indicate that water reserves in excess of those required to maintain an abundant supply of water to inhabitants of the CWC's service area exist now and will continue to exist for the permit duration when construction of the new water treatment plant is completed. The permit expires and must be renewed on or before January 14th, 2025. The approval does not preclude a future determination should conditions change or new information indicate a need for additional review.

The proposed bi-directional interconnection is planned for routine supplemental bulk water sales to the University of Connecticut and for emergency use only when water is required by The Connecticut Water Company due to equipment failure, natural disasters and other events which render a system component inoperable. The University of Connecticut has agreed to restrict water usage in the same manner as the Connecticut Water Company in accordance with CWC's Western Region Northern System water supply plan emergency contingency provisions. A Department of Energy and Environmental Protection (DEEP) diversion permit has been submitted for the DEEP's agency review of this public water system interconnection. Please contact Cheryl A. Chase at (860) 424-3860 for status if necessary. If you have questions regarding the enclosed Sale of Excess Water (SEW) permit, please contact Steve Messer of my staff at (860) 509-7333 or steve.messer@ct.gov.

Sincerely,

LMathieu

Lori Mathieu
Public Health Section Chief
Drinking Water Section

cc: Mr. Jason Coite, P.E., Environmental Compliance Manager
Ms. Cheryl Chase, DEEP, Inland Water Resources Division

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

Jewel Mullen, M.D., M.P.H., M.P.A.
Commissioner

Dannel P. Malloy
Governor
Nancy Wyman
Lt. Governor

PERMIT #SEW15-01R

SALE OF EXCESS WATER PERMIT

In accordance with the provisions of Section 22a-358 of the Connecticut General Statutes, the Connecticut Water Company (CWC) is hereby authorized to sell supplemental bulk excess water to the University of Connecticut on a regular basis up to a maximum of 1.5 million gallons per day (MGD). A legal contract that is dated December 18th, 2013 between the Connecticut Water Company and the University of Connecticut stipulates that the maximum permissible bulk water sales of 1.5 MGD can occur daily, monthly, and/or yearly. This permit constitutes the approval required by Connecticut General Statutes (CGS) section 22a-358 and shall expire and be null and void on January 14th, 2025 unless specifically renewed and extended by the Commissioner of Public Health. This approval is issued because CWC's Western Region Northern System has established to satisfaction of the Commissioner that water reserves in excess of those required to maintain an abundant supply of water to the inhabitants of its service area exist and will continue to exist for the ten (10) year permit duration when construction of a new 9.0 MGD water treatment plant at Lake Shenipsit by the Connecticut Water Company is completed.

The University of Connecticut has agreed to restrict water usage in the same manner as the Connecticut Water Company in accordance with CWC's Western Region Northern System water supply plan emergency contingency provisions. The CWC's Western Region Northern System and the University of Connecticut WFD are required to meter and report all water use pursuant to the Regulations of Connecticut State Agencies (RCSA) sections 19-13-B102(n) and 25-32d-3(b)4. A Department of Energy and Environmental Protection (DEEP) diversion permit has been submitted for the DEEP's agency review of this public water system interconnection.

This permit is subject to, and does not derogate, any present or future property rights or other rights or powers of the State Connecticut, and conveys no property rights in real estate, material, or water, nor any exclusive privileges. This permit is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the property or activity affected thereby. The Commissioner may suspend or revoke this permit at any time if it is found that any condition of this permit has been violated, or if such action is necessary to maintain the purity and adequacy of the water supply.

L Mathieu

Lori Mathieu, Public Health Section Chief
Drinking Water Section

1/14/15
Date

APPENDIX C

Diversion Permits and Registrations

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

PERMIT

Permittees: The Connecticut Water Company
93 West Main Street, Clinton CT 06413-0562
Attn: David Radka

The University of Connecticut
31 LeDoyt Road, Unit 3055, Storrs, CT 06269-3055
Attn: Jason Coite

Permit No: DIV-201404187

Town: Ellington, Vernon, Tolland, Coventry, Mansfield

Project: Interconnection and diversion of water from the Connecticut Water Company public water system in Tolland to the University of Connecticut and the Town of Mansfield

Waters: Shenipsit Lake, Hockanum River, Willimantic River

Pursuant to Connecticut General Statutes Section 22a-368, the Commissioner of Energy and Environmental Protection ("Commissioner") hereby grants a permit to The Connecticut Water Company and The University of Connecticut ("the Permittees") to conduct regulated activities associated with the interconnection and transfer of water from the Connecticut Water Company public water system in Tolland to the University of Connecticut and Mansfield. The purpose of said activities is to provide supplemental public water supplies to the University of Connecticut and the Town of Mansfield.

AUTHORIZED ACTIVITY

Specifically, the permittees are authorized to: 1) transfer a maximum of 1.85 million gallons per day of potable water from The Company's Northern Operations Western System to Mansfield and the University of Connecticut's public water system Connecticut Water via a proposed regional 5.3 mile pipeline along Route 195, and 2) installation of a 0.5 mile water distribution main emanating from the aforementioned regional pipeline westerly along Route 44 from Mansfield Four Corners to the vicinity of the Jensen's Mobile Home Park. The location of the regional pipeline and the water distribution main authorized by this permit are referred to as "the Site".

The activities proposed will impact Shenipsit Lake, Hockanum River, and the Willimantic River.

All activities shall be conducted in accordance with plans entitled: "Water Systems and Proposed Improvements / Tolland-Mansfield Regional Pipeline and Interconnection / Tolland, Coventry &

Mansfield, CT," prepared by Milone & MacBroom, dated 12/6/2013, revised through 4/7/2014, submitted as a part of the application.

This authorization constitutes the licenses and approvals required by Section 22a-368 of the Connecticut General Statutes.

This authorization is subject to and does not derogate any present or future property rights or other rights or powers of the State of Connecticut, conveys no property rights in real estate or material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state, or local laws or regulations pertinent to the property or activity affected thereby.

The permittees' failure to comply with the terms and conditions of this permit shall subject the permittees, including the permittees' agents or contractor(s) to enforcement actions and penalties as provided by law.

This authorization is subject to the following conditions:

CONDITIONS:

1. **Expiration.** This permit shall expire on May 29, 2040.

2. **Construction Commencement and Completion.** If construction of any structures or facilities authorized herein is not completed within three years of issuance of this permit or within such other time as may be provided by this permit, or if any activity authorized herein is not commenced within three years of issuance of this permit or within such other time as may be provided by this permit, this permit shall expire three years after issuance or at the end of such time as may be authorized by the Commissioner.

3. **Notification of Project Initiation.** The permittees shall notify the Commissioner in writing two weeks prior to: (A) commencing construction or modification of structures or facilities authorized herein; and (B) initiating the diversion authorized herein.

4. **De minimis Alteration**. For Water Diversion Permits (CGS 22a-368) - The permittees may not make any alterations, except de minimis alterations, to any structure, facility, or activity authorized by this permit unless the permittees apply for and receives a modification of this permit in accordance with the provisions of section 22a-377(c)-2 of the Regulations of Connecticut State Agencies. Except as authorized by subdivision (5) of section 22a-377(b)-1(a) of the Regulations of Connecticut State Agencies, the permittee may not make any de minimis alterations to any structure, facility, or activity authorized by this permit without written permission from the Commissioner. A de minimis alteration means an alteration which does not significantly increase the quantity of water diverted or significantly change the capacity to divert water.

5. **Maintenance of Structures.** All structures, facilities, or activities constructed, maintained, or conducted pursuant hereto shall be consistent with the terms and conditions of this permit, and any structure, facility or activity not specifically authorized by this permit, or exempted pursuant to section 22a-377 of the General Statutes or section 22a-377(b)-1 of the Regulations of Connecticut State Agencies, or otherwise exempt pursuant to other General Statutes, shall constitute a violation hereof which may result in modification, revocation or suspension of this permit or in the institution of other legal proceedings to enforce its terms and conditions.

   Unless the permittees maintain in optimal condition any structures or facilities authorized by this permit, the permittees shall remove such structures and facilities and restore the affected waters to their condition prior to construction of such structures or facilities.

6. **Accuracy of Documentation.** In issuing this permit, the Commissioner has relied on information provided by the permittees. If such information was false, incomplete, or misleading, this permit may be modified, suspended or revoked and the permittees may be subject to any other remedies or penalties provided by law.

7. **Best Management Practices & Notification of Adverse Impact**. In constructing or maintaining any structure or facility or conducting any activity authorized herein, or in removing any such structure or facility under condition 5 hereof, the permittees shall employ best management practices to control storm water discharges, to prevent erosion and sedimentation, and to otherwise prevent pollution of wetlands and other waters of the State. Best Management Practices include, but are not limited, to practices identified in the *Connecticut Guidelines for Soil Erosion and Sediment Control* as revised, *2004 Connecticut Stormwater Quality Manual*, Department of Transportation's *ConnDOT Drainage Manual* as revised, and the Department of Transportation Standard Specifications as revised.

   The permittees shall immediately inform the Commissioner of any adverse impact or hazard to the environment which occurs or is likely to occur as the direct result of the construction, maintenance, or conduct of structures, facilities, or activities authorized herein.

8. **Reporting of Violations.** The permittees shall, no later than 48 hours after the permittees learn of a violation of this permit, report same in writing to the Commissioner. Such report shall contain the following information:

   a. the provision(s) of this permit that has been violated;
   b. the date and time the violation(s) was first observed and by whom;
   c. the cause of the violation(s), if known
   d. if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;

e. if the violation(s) has not ceased, the anticipated date when it will be corrected;
f. steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented;
g. the signatures of the permittee(s) and of the individual(s) responsible for actually preparing such report, each of whom shall certify said report in accordance with condition 12 of this permit.

9. **Material Storage in the Floodplain.** The storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five-hundred (500) year flood is prohibited. Any other material or equipment stored at the site below said elevation by the permittees or the permittees' contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.

10. **Permit Transfer.** This permit is not transferable without the prior written consent of the Commissioner.

11. **Contractor Notification**. The permittees shall give a copy of this permit to the contractor(s) who will be carrying out the activities authorized herein prior to the start of construction and shall receive a written receipt for such copy, signed and dated by such contractor(s). The permittees' contractor(s) shall conduct all operations at the Site in full compliance with this permit and, to the extent provided by law, may be held liable for any violation of the terms and conditions of this permit.

12. **Certification of Documents**. Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this permit shall be signed by the permittees or a responsible corporate officer of the permittees, a general partner of the permittees, and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement in the submitted information may be punishable as a criminal offense in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b and in accordance with any other applicable statute."

13. **Submission of Documents**. Any document or notice required to be submitted to the Commissioner under this permit shall, unless otherwise specified in writing by the Commissioner, be directed to:

    Director, Inland Water Resources Division
    Department of Energy and Environmental Protection
    79 Elm Street
    Hartford, CT 06106-5127

    The date of submission to the Commissioner of any document required by this permit shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this permit, including but not limited to notice of approval or disapproval on any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means any calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

14. **Rights.** This permit is subject to and does not derogate any rights or powers of the State of Connecticut, conveys no property rights or exclusive privileges, and is subject to all public and private rights and to all applicable federal, state, and local law. In constructing or maintaining any structure or facility or conducting any activity authorized herein, the permittees may not cause pollution, impairment, or destruction of the air, water, or other natural resources of this State. The issuance of this permit shall not create any presumption that this permit should be renewed.

15. **Shenipsit Lake Stream Flow Release.**
    a. In order to mitigate potential fisheries impact resulting from the authorized diversion, the permittees shall maintain the current stream flow release of 3.24 cubic feet per second (cfs), with the current spring freshet release as defined in Table L-1 in Attachment L of their application dated April 23, 2014. Such stream flow releases shall be made from the Shenipsit Lake to the Hockanum River immediately downstream of the lake, and
    b. Within ten (10) years of the issuance of this permit, the permittees shall make stream flow releases from the Shenipsit Lake fully coincident with Class 3 releases as defined in section 26-141b-6(a)(3) and 26-141b-6(b) of the Regulations of Connecticut State Agencies (RCSA).
    c. The permittees may request from the commissioner an extension of time to comply with the releases as defined in section 26-141b-6(a)(3) RCSA. Any such request for a time extension shall be submitted in writing to the commissioner and shall include reasons for such a request, including but not limited to, engineering,

financial, permitting, or public health considerations. The commissioner shall have sole discretion to approve or deny such request.

d. The permittees may request an alternative site specific release compatible with the standards of section 26-141b-6(f)(2) of the RCSA.
e. In accordance with commitments made by the permittees in the application, the permittees shall not reduce managed stream flow releases from Shenipsit Lake due to an inadequate water supply margin of safety for the duration of this permit.

16. **Stream Discharge Record Keeping and Reporting.** The permittees shall monitor and record the daily discharge to the Hockanum River immediately downstream of the Shenipsit Lake. The permittees shall record the stage reading, the gate opening, the date and time of the reading and the converted flow value at the time of measurement. The permittees shall also record the number of hours elapsed since their discharge to the Hockanum River has fallen below the specified trigger thresholds as required in Condition #15. A copy of the daily discharge records shall be included in the Annual Report to the Commissioner required by Condition #23 of this permit.

17. **Metering**. The permittees shall measure the total amount of water transferred each day from The Connecticut Water Company water supply system to the Town of Mansfield and the University of Connecticut at the intersection of Route 195 and Towers Loop Road in Mansfield and shall for the duration of this authorization continuously operate and maintain any meters used in such measuring in good working order. In the event of meter malfunction or breakage, the permittees shall repair or replace such meter within 72 hours. The permittees shall submit for the Commissioner's approval a metering plan no later than 60 days prior to the initiation of the diversion.

18. **Meter Calibration**. The permittees shall biennially test and calibrate any distribution meter used for measuring the total amount of water transferred each day within two percent accuracy as shown through a post-calibration test. The permittees shall maintain a record of the accuracy and calibration test(s) along with supporting documentation and certifications. The permittees shall make a copy of said records available to the Commissioner or the Commissioner's designee immediately upon request.

19. **Daily Transfer Record**. The permittees shall maintain a daily record of the meter readings indicating the total volume of water in gallons transferred from The Connecticut Water Company water system to the Town of Mansfield and the University of Connecticut water supply system that day. The daily record shall also record the time of meter readings and denote and explain any instances in which the diversion of water exceeded the authorized withdrawal limitation(s) specified in this permit. A copy of the daily record of withdrawals shall be included in the Annual Report to the Commissioner required by Condition #23 of this permit.

20. **Leak Detection**. Within five years of the issuance of this permit, and every five years thereafter, the permittees shall complete a system wide comprehensive leak detection survey of the water distribution system and repair any leaks found. The leak detection survey shall follow standards and criteria contained within AWWA Manual M36 as may be amended or revised. A copy of all actions taken pursuant to the leak detection survey, including the number of miles of main surveyed, survey techniques and methodology, leaks found and repairs made shall be included in the Annual Report to the Commissioner required by Condition #23 of this permit.

21. **Long-range Water Conservation Plan**. The permittees shall implement their Long-range Water Conservation Plans, as described in the permittees' application, and in accordance with the permittees' Water Supply Plan as approved pursuant to CGS Section 25-32d and any amendments or updates thereto. The permittees shall maintain a summary of all actions taken each year pursuant to the Long-range Water Conservation Plan and a description of the estimated or actual water savings achieved. A copy of this summary shall be included in the Annual Report to the Commissioner required by Condition #23 of this permit.

22. **Record Keeping Requirements**. Except as provided below, or as otherwise specified in writing by the commissioner, all information required under this permit shall be retained at the permittees' principal place of business, or be readily available on request. The permittees shall maintain a copy of this permit on Site at all times during the construction of the pipeline. The permittees shall retain copies of all records and reports required by this permit; and records of all data used to compile these reports for a period of at least ten years from the date such data was generated or report created, whichever is later.

23. **Annual Reporting**. The permittees shall submit by February 28 of each year, for the duration of this authorization, an Annual Report for the preceding calendar year. The Annual Report shall be certified in accordance with Condition #12 of this permit and shall contain a compilation of the following:
    a. A copy of the daily record of stream discharge as required by Condition #16 of this permit;
    b. A copy of the records documenting the daily transfer of water from The Connecticut Water Company water system to The University of Connecticut water supply system as required by Condition #29 of this permit;
    c. A copy of the leak detection report as required by Condition #20 of this permit;
    d. A summary report from each permittee of all the actions taken pursuant to the Long-Range Water Conservation Plan and Water Conservation Plan and description of actual or estimated water savings achieved, as required by Condition #21 of this permit;
    e. A copy of the list of the number and types of customers connected to the regional pipeline during the prior year as required by Condition #26; and

f. Denotation and explanation of any instances of violation of the authorized withdrawal limitation(s) or any other condition of this authorization.

24. **Wood Turtle Conservation.** To limit the potential for impacts to Wood Turtles (a Connecticut species of special concern) at locations as indicated on Figure 4-3 of Attachment D-4 of the permittees' application, project construction activities should be restricted to the turtles' dormant period of November 1 to April 1 at said locations. If work must be done during the turtle's active period of April 1 to November 1 at said locations, the permittee shall adhere to the following precautionary measures:

- silt fencing shall be installed around the appropriate work area prior to construction,
- work crews shall be apprised of the species description and possible presence prior to construction,
- work crews shall search the work area for wood turtles each day prior to construction,
- any wood turtles encountered during the work shall be moved unharmed to an area immediately outside of the fenced work area and oriented in the same direction it was walking when found,
- all precautionary measures should be taken to avoid degradation to wetland habitats including any wet meadows and seasonal pools,
- work conducted in these habitats during the early morning and evening hours should occur with special care not to harm basking or foraging individuals,
- no heavy machinery or vehicles shall be parked in any turtle habitat and precautions shall be taken when the machinery is traveling to the work area to avoid turtles,
- work conducted during the early morning and evening hours shall occur with special care not to harm basking or foraging individuals, and
- all silt fencing shall be removed after work is completed when soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.

Refer to the attached fact sheet for species and habitat description.

25. **Southern Bog Lemming Conservation.** Work crews shall be apprised of the species description, habitat and possible presence of the Southern Bog Lemming, at locations as indicated on Figure 4-3 of Attachment D-4 of the permittees' application, prior to construction. Refer to the attached fact sheet for species and habitat description.

26. **New Service Connections.** New service connections along the distribution pipeline route from Tolland, or more intensive use of an existing service connection along said route, from water supplied pursuant to this permit shall be limited to only those proposed land uses of an intensity allowed under local plans of conservation and development as of the

date of the Connecticut Office of Policy and Managements' notice of Environmental Impact Evaluation sufficiency (September 16, 2013). Connections for users of greater intensity will be allowed only if determination is made by State or local agencies, within their applicable authorities, including but not limited to the Public Utility Regulatory Authority pursuant to Section 16-10 Connecticut General Statutes, that such connection is necessary to address a demonstrated environmental, public health, public safety, economic, social, or general welfare concern. The permittees shall provide in the annual report as, required by Condition #23 of this permit, a list of the number and types of customers connected to the pipeline during the prior year.

Issued by the Commissioner of Energy and Environmental Protection on:

6/29/15
Date

Robert Klee
Commissioner

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

June 21, 1991

Mr. Larry Schilling
Executive Director of the Physical Plant
University of Connecticut
Physcial Plant
Box U-28
624 Gilbert Road Extension
Storrs, CT 06269

Dear Mr. Schilling:

Pursuant to your petition under the provision of Section 22a-377(c)-2 of the Regulations of Connecticut State Agencies, this will acknowledge registration in accordance with Section 22a-368 of the Connecticut General Statutes of the following diversions:

Groundwater Withdrawal	Source I.D.	Maximum Withdrawal MGD.	Subregional Basin Number
Fenton Road Wellfield		.8443	3207
Williamantic River Wellfield		1.5877	3100

Sincerely yours,

Thomas M. Morrissey

Thomas M. Morrissey, Director
Inland Wetlands Resources Unit

TMM:WW:ps

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER MANAGEMENT

August 21, 1995

Larry G. Schilling
Executive Director of Facilities Management
University of Connecticut
624 Gilbert Road Extension
U-38
Storrs, CT 06269-1038

Re: Willimantic Wellfield, Mansfield CT

Dear Mr. Schilling:

This is in reply to your July 13, 1995 letter regarding the captioned wellfield and its registration under the Connecticut Water Diversion Policy Act, section 22a-368 of the General Statutes.

The State of Connecticut had for some time prior to July 1, 1982 been maintaining diversions from a number of wells at the Willimantic Wellfield to service state owned facilities at the University and the Mansfield Training School. In accordance with said section 22a-368, the University and the Mansfield Training School separately registered with the Commissioner of the DEP certain of the wells in the wellfield. In 1993, pursuant to Public Act 93-80, our Department of Public Works transferred the training school land, buildings and improvements to the University. The University plans to use the well (well #2) registered by the Mansfield Training School to maintain and expand service within the University's supply system.

Section 22a-377(b)-1(5) of the Regulations of Connecticut State Agencies exempts from permitting requirements diversions which are:

> "... incidental to providing water treatment, extending distribution mains, or maintaining or expanding service within a service area, provided the quantity of water withdrawn form any sources does not exceed the quantity authorized pursuant to any applicable permit or registration issued or filed under section 22a-368 of the General Statutes."

The proposed action is exempt from permit requirements.

We have noted in our registration records that Mansfield Training

School Well # 2 is now known as "UCONN Well #4 having a registered capacity of 0.720 mgd.

Should you have any questions on this matter, please contact Denis Cunningham of my staff at (203) 424-3019.

Sincerely,

Robert L. Smith

Robert L. Smith
Bureau Chief

RLS/DC

RECEIVED

AUG 25 1995

OFFICE OF FACILITIES
UNIVERSITY OF CONNECTICUT

APPENDIX D

Source Water Assessment Reports

SOURCE WATER ASSESSMENT REPORT

AN EVALUATION OF THE SUSCEPTIBILITY OF PUBLIC DRINKING WATER SOURCES TO POTENTIAL CONTAMINATION

APA **135**

University Of Connecticut
Fenton River Wellfield

The State of Connecticut Department of Public Health (DPH) in cooperation with the Department of Environmental Protection (DEP) recently completed an assessment of the Fenton River Wellfield, which is a source of public drinking water that is maintained and operated by the University Of Connecticut. This one-time assessment is part of a nationwide effort mandated by Congress under the Safe Drinking Water Act Amendments of 1996 to evaluate the susceptibility of all public drinking water sources in Connecticut to potential sources of contamination. DPH began working in partnership with the DEP in 1997 to develop Connecticut's Source Water Assessment Program, which was approved by the U.S. Environmental Protection Agency in 1999. Sources of potential contamination that are of concern to public drinking water supplies here in Connecticut are generally associated with historic waste disposal or commercial, industrial, agricultural and residential properties that store or use hazardous materials like petroleum products, solvents or agricultural chemicals.

The assessment is intended to provide University Of Connecticut consumers with information about where their public drinking water comes from, sources of potential contamination that could impact it, and what can be done to help protect it. This assessment will also assist the public water supply system, regional planners, local government, public health officials and state agencies in evaluating the degree to which the Fenton River Wellfield may be at risk from potential sources of contamination. The assessment can be used to target and implement enhanced source water protection measures such as routine inspections, protective land use regulations, acquisition of critical land, proper septic system maintenance, and public education. General sources of contamination with the potential to impact the Fenton River Wellfield include properties with underground fuel storage tanks, improperly maintained on-site septic systems, improper waste disposal, or commercial/industrial sites that store or use chemicals or generate hazardous wastes.

Fenton River Wellfield Source Water Assessment Summary

STRENGTHS

Local aquifer protection regulations adopted

Public Water System Source Protection Program

Less than 10% of this source water area is currently developed for commercial or industrial use

POTENTIAL RISK FACTORS

Potential contaminant sources in source water area

Susceptibility Rating

Rating	Environmental Sensitivity	Potential Risk Factors	Source Protection Needs
Low	X	X	X
Moderate			
High			

Overall Susceptibility Rating: Low

This rating indicates susceptibility to potential sources of contamination that may be in the wellfield source water area and does not necessarily imply poor water quality.

Detailed information about the specific factors and information used in establishing this rating can be found in Table 1. Information about opportunities to improve protection in the Fenton River Wellfield source water area is also presented in Table 2.

CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

Keeping Connecticut Healthy

State of Connecticut Department of Public Health

Drinking Water Division

410 Capitol Avenue – MS# 51WAT
P.O. Box 340308 Hartford, CT 06134
(860) 509-7333

Produced With Funding Provided By The United States Environmental Protection Agency - May 2003

OVERVIEW - The Fenton River Wellfield is located in an aquifer that is comprised largely of water-bearing sand and gravel deposits. The source water area is delineated by a final Level A aquifer protection mapping area, which encompasses some 1360.0 acres of land in Mansfield and Willington. Vacant land and residential properties in the Fenton River Wellfield source water area presently account for approximately 87.2 percent of the land cover. Commercial development at 2.5 percent and agricultural land use at 10.3 percent, account for the remainder of the land coverage's in the source water area. Information about drinking water quality and treatment is available in the University Of Connecticut's annual Consumer Confidence Report.

ASSESSMENT METHODS.

The drinking water source assessment methods used by the Department of Public Health Drinking Water Division to evaluate the susceptibility of public drinking water sources to contamination are based on criteria individually tailored to surface water and groundwater sources. The criteria are keyed to sanitary conditions in the source water area, the presence of potential or historic sources of contamination, existing land use coverage's, and the need for additional source protection measures within the source water area. Source-specific data for community and non-community systems were used to determine whether a particular criterion should be rated as low, moderate or high, relative to the risk of potential contamination at the drinking water source. Further, a ranking system was used to compute an average rank for each community drinking water source based on its environmental sensitivity, potential risk of contamination and source protection needs.

Wellfields rated as having a low, moderate or high susceptibility to potential sources of contamination generally exhibit the characteristics summarized in Table 1.

Table 1 – General Source Water Area Characteristics and Susceptibility Ratings

Susceptibility Rating	**General Characteristics of the Source Water Area***
Low	Low density of potential contaminant sources Lower intensity of land development
Moderate	Low to moderate density of potential contaminant sources Moderate intensity of land development
High	Moderate to high density of potential contaminant sources Higher intensity of land development No local aquifer protection regulations Detectable nitrates and/or volatile organic chemicals in the untreated source water during the past three years that are below the maximum contaminant levels allowed by state and federal drinking water regulations

*** Note: Not all characteristics may be present for a given susceptibility rating**

Readers of this assessment are encouraged to use the attached glossary to assist in the understanding of the terms and concepts used throughout this report.

Maps representing the location and features of the Fenton River Wellfield source water area have not been included with this assessment report because of homeland security concerns

FENTON RIVER WELLFIELD ASSESSMENT RESULTS.

Based on a combination of current wellfield and source water area conditions, existing potential contaminant sources, and the level of source protection measures currently in place, the source water assessment for this wellfield indicates that it has an overall Low risk of contamination from identified potential sources of contamination. The assessment findings for the Fenton River Wellfield are summarized in Table 2, which lists current conditions in the wellfield source water area and recommendations or opportunities to enhance protection of this public drinking water source. A listing of potential contaminant source types in the area can be found in Table 3. A summary of source water area features is shown in Table 4.

The assessment of this and other comparable wellfields throughout Connecticut generally finds that adopting recommendations similar to those presented in Table 2 could reduce the susceptibility of most groundwater sources to potential sources of contamination.

Table 2 **Source Water Assessment Findings and Source Protection Opportunities**

Fenton River Wellfield

Assessment Category	**Conditions Through June 2002**	**Recommendations and Source Protection Opportunities**
Environmental Sensitivity Factors	All wells in the Fenton River Wellfield are sited and constructed in accordance with DPH regulations and the most recent DPH sanitary survey of this wellfield indicates that it is free of deficiencies.	
Contaminants Detected in Untreated Source Water	None Except where noted above, any detected contaminants listed are below maximum contaminant levels (MCL) established by the federal government or guidance levels established by the Connecticut Department of Public Health. The presence of these contaminants, in general, indicates that this wellfield is sensitive to human activity. Click here to review EPA's current drinking water standardsT	Maintain monitoring levels specified in the Connecticut Public Health Code Section 19-13-B102 Encourage homeowners to adopt residential best management practices that minimize the use hazardous materials or generation of hazardous waste.
Potential Risk Factors	Potential contaminant sources in source water area More than 50% of land for this source water area is undeveloped, which could present a risk if developed inappropriately.	Periodically inspect SPCS sites and maintain a water quality monitoring program consistent with the level of potential risk Proactively work with local officials and developers to insure that only low-risk development occurs within the source water area Encourage residential property owners to conduct scheduled inspections and maintenance of underground fuel storage tanks and on-site septic systems.
Source Protection Needs Factors	Level A aquifer mapping completed 100 percent ownership or control of sanitary radius around wellheads in wellfield. Aquifer protection regulations adopted for the entire source water area Less than 10% of the land in the source water area exists as preserved open space	Complete Level A mapping Support and encourage the acquisition of open space land within the source water area Support environmental awareness and education within the community.

Inventoried significant potential contaminant sources in the Fenton River Wellfield source water area are listed in Table 3. While these facilities have the potential to cause groundwater contamination, there is no indication that they are doing so at this time.

Table 3 **Summary of Significant Potential Contaminant Types in the Fenton River Wellfield Source Water Area**

Category	Subcategory	Number of SPCS Types
Waste Storage, Handling, Disposal	Hazardous Waste Facilities	0
	Solid Waste Facilities	0
	Miscellaneous	0
Bulk Chemical, Petroleum Storage	Underground Storage Tanks	2
	Tank Farms	0
	Warehouses	0
Industrial Manufacturing / Processing	Chemical & Allied Production	0
	Chemical Use Processing	0
	Miscellaneous	1
Commercial Trades and Services	Automotive and Related Services	0
	Chemical Use Services	0
	Miscellaneous	0
Agriculture and Related	Pesticide Storage, Handling or Application	0
Total Number of Contaminant Types		3

Prominent features of the Fenton River Wellfield source water area are summarized in Table 4.

Table 4 **Features of the *Fenton River Wellfield* Source Water Area**

Number and Type of Public Drinking Water Supply Wells	1 caisson and 3 stratified drift wells
Source Water Area Delineation Method [a]	final Level A
DEP Groundwater Classification	GAA - Groundwater used as a public drinking water supply, presumed to be drinkable without treatment
Size of Source Water Area	1360.0 acres
Location of Source Water Area	Mansfield and Willington
Predominant Land Use and Land Cover in Source Water Area [b] -Urban - Commercial or Industrial -Urban - Residential -Agricultural -Undeveloped Land	 2.5 % 3.0 % 10.3 % 84.2 %
Preserved Land In Source Water Area [d]	18.5 acres
Significant Potential Contamination Sources -Number of inventoried facilities in source water area -Count of inventoried facilities per square mile -Number of contaminant sources within inventoried facilities	 3 1.41 per sq mile 3
Number of Contaminant Release Points Inventoried by CTDEP [c]	0

[a] Source water delineation method depends on data available for the wellfield

[b] Based on statewide data layer of land use and land cover developed by UCONN Dept of Natural Resource Management Engineering and Connecticut DEP satellite imagery.

[c] Sites or locations with documented accidental spills, leaks or discharges. While these sources, which are cataloged and tracked by the Connecticut DEP, may fall within a public drinking water supply source water area, they may or may not presently be discharging to the environment or causing contamination of a public drinking water source.

[d] Any combination of state forest and parklands and municipally or privately held land designated as open space.

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SOURCE WATER ASSESSMENT REPORT

AN EVALUATION OF THE SUSCEPTIBILITY OF PUBLIC DRINKING WATER SOURCES TO POTENTIAL CONTAMINATION

APA 136

University Of Connecticut
Willimantic River Wellfield

The State of Connecticut Department of Public Health (DPH) in cooperation with the Department of Environmental Protection (DEP) recently completed an assessment of the Willimantic River Wellfield, which is a source of public drinking water that is maintained and operated by the University Of Connecticut. This one-time assessment is part of a nationwide effort mandated by Congress under the Safe Drinking Water Act Amendments of 1996 to evaluate the susceptibility of all public drinking water sources in Connecticut to potential sources of contamination. DPH began working in partnership with the DEP in 1997 to develop Connecticut's Source Water Assessment Program, which was approved by the U.S. Environmental Protection Agency in 1999. Sources of potential contamination that are of concern to public drinking water supplies here in Connecticut are generally associated with historic waste disposal or commercial, industrial, agricultural and residential properties that store or use hazardous materials like petroleum products, solvents or agricultural chemicals.

The assessment is intended to provide University Of Connecticut consumers with information about where their public drinking water comes from, sources of potential contamination that could impact it, and what can be done to help protect it. This assessment will also assist the public water supply system, regional planners, local government, public health officials and state agencies in evaluating the degree to which the Willimantic River Wellfield may be at risk from potential sources of contamination. The assessment can be used to target and implement enhanced source water protection measures such as routine inspections, protective land use regulations, acquisition of critical land, proper septic system maintenance, and public education. General sources of contamination with the potential to impact the Willimantic River Wellfield include properties with underground fuel storage tanks, improperly maintained on-site septic systems, improper waste disposal, or commercial/industrial sites that store or use chemicals or generate hazardous wastes.

Willimantic River Wellfield Source Water Assessment Summary

STRENGTHS

Local aquifer protection regulations adopted

Public Water System Source Protection Program

Less than 10% of this source water area is currently developed for commercial or industrial use

POTENTIAL RISK FACTORS

Potential contaminant sources in source water area

1 contaminant release point in source water area

Susceptibility Rating

Rating	Environmental Sensitivity	Potential Risk Factors	Source Protection Needs
Low	X	X	
Moderate			X
High			

Overall Susceptibility Rating: Low

This rating indicates susceptibility to potential sources of contamination that may be in the wellfield source water area and does not necessarily imply poor water quality.

Detailed information about the specific factors and information used in establishing this rating can be found in Table 1. Information about opportunities to improve protection in the Willimantic River Wellfield source water area is also presented in Table 2.

CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

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State of Connecticut Department of Public Health
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410 Capitol Avenue – MS# 51WAT
P.O. Box 340308 Hartford, CT 06134
(860) 509-7333

Produced With Funding Provided By The United States Environmental Protection Agency - May 2003

OVERVIEW - The Willimantic River Wellfield is located in an aquifer that is comprised largely of water-bearing sand and gravel deposits. The source water area is delineated by a preliminary Level B aquifer protection mapping area, which encompasses some 1660.0 acres of land in Coventry and Mansfield. Vacant land and residential properties in the Willimantic River Wellfield source water area presently account for approximately 78.3 percent of the land cover. Commercial development at 1.9 percent and agricultural land use at 19.8 percent, account for the remainder of the land coverage's in the source water area. Information about drinking water quality and treatment is available in the University Of Connecticut's annual Consumer Confidence Report.

ASSESSMENT METHODS.

The drinking water source assessment methods used by the Department of Public Health Drinking Water Division to evaluate the susceptibility of public drinking water sources to contamination are based on criteria individually tailored to surface water and groundwater sources. The criteria are keyed to sanitary conditions in the source water area, the presence of potential or historic sources of contamination, existing land use coverage's, and the need for additional source protection measures within the source water area. Source-specific data for community and non-community systems were used to determine whether a particular criterion should be rated as low, moderate or high, relative to the risk of potential contamination at the drinking water source. Further, a ranking system was used to compute an average rank for each community drinking water source based on its environmental sensitivity, potential risk of contamination and source protection needs.

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High	Moderate to high density of potential contaminant sources Higher intensity of land development No local aquifer protection regulations Detectable nitrates and/or volatile organic chemicals in the untreated source water during the past three years that are below the maximum contaminant levels allowed by state and federal drinking water regulations

** Note: Not all characteristics may be present for a given susceptibility rating*

Readers of this assessment are encouraged to use the attached glossary to assist in the understanding of the terms and concepts used throughout this report.

Maps representing the location and features of the Willimantic River Wellfield source water area have not been included with this assessment report because of homeland security concerns

WILLIMANTIC RIVER WELLFIELD ASSESSMENT RESULTS.

Based on a combination of current wellfield and source water area conditions, existing potential contaminant sources, and the level of source protection measures currently in place, the source water assessment for this wellfield indicates that it has an overall Low risk of contamination from identified potential sources of contamination. The assessment findings for the Willimantic River Wellfield are summarized in Table 2, which lists current conditions in the wellfield source water area and recommendations or opportunities to enhance protection of this public drinking water source. A listing of potential contaminant source types in the area can be found in Table 3. A summary of source water area features is shown in Table 4.

The assessment of this and other comparable wellfields throughout Connecticut generally finds that adopting recommendations similar to those presented in Table 2 could reduce the susceptibility of most groundwater sources to potential sources of contamination.

Table 2

Source Water Assessment Findings and Source Protection Opportunities
Willimantic River Wellfield

Assessment Category	Conditions Through June 2002	Recommendations and Source Protection Opportunities
Environmental Sensitivity Factors	All wells in the Willimantic River Wellfield are sited and constructed in accordance with DPH regulations and the most recent DPH sanitary survey of this wellfield indicates that it is free of deficiencies.	
Contaminants Detected in Untreated Source Water	None Except where noted above, any detected contaminants listed are below maximum contaminant levels (MCL) established by the federal government or guidance levels established by the Connecticut Department of Public Health. The presence of these contaminants, in general, indicates that this wellfield is sensitive to human activity. Click here to review EPA's current drinking water standardsT	Maintain monitoring levels specified in the Connecticut Public Health Code Section 19-13-B102 Encourage homeowners to adopt residential best management practices that minimize the use hazardous materials or generation of hazardous waste.
Potential Risk Factors	Potential contaminant sources in source water area 1 contaminant release point in source water area More than 50% of land for this source water area is undeveloped, which could present a risk if developed inappropriately.	Periodically inspect SPCS sites and maintain a water quality monitoring program consistent with the level of potential risk Maintain an adequate level of surveillance around contaminant release point sites to insure that groundwater contamination is not occurring Proactively work with local officials and developers to insure that only low-risk development occurs within the source water area Encourage residential property owners to conduct scheduled inspections and maintenance of underground fuel storage tanks and on-site septic systems.
Source Protection Needs Factors	Level B aquifer mapping completed 100 percent ownership or control of sanitary radius around wellheads in wellfield. Aquifer protection regulations adopted for the entire source water area Less than 10% of the land in the source water area exists as preserved open space	Complete Level A mapping Adhere to local aquifer protection regulations Support and encourage the acquisition of open space land within the source water area Support environmental awareness and education within the community.

M-3

Inventoried significant potential contaminant sources in the Willimantic River Wellfield source water area are listed in Table 3. While these facilities have the potential to cause groundwater contamination, there is no indication that they are doing so at this time.

Table 3 **Summary of Significant Potential Contaminant Types in the Willimantic River Wellfield Source Water Area**

Category	Subcategory	Number of SPCS Types
Waste Storage, Handling, Disposal	Hazardous Waste Facilities	0
	Solid Waste Facilities	0
	Miscellaneous	0
Bulk Chemical, Petroleum Storage	Underground Storage Tanks	1
	Tank Farms	0
	Warehouses	0
Industrial Manufacturing / Processing	Chemical & Allied Production	0
	Chemical Use Processing	0
	Miscellaneous	0
Commercial Trades and Services	Automotive and Related Services	0
	Chemical Use Services	1
	Miscellaneous	0
Agriculture and Related	Pesticide Storage, Handling or Application	0
Total Number of Contaminant Types		2

Prominent features of the Willimantic River Wellfield source water area are summarized in Table 4.

Table 4 **Features of the *Willimantic River Wellfield* Source Water Area**

Number and Type of Public Drinking Water Supply Wells	4 stratified drift wells
Source Water Area Delineation Method [a]	preliminary Level B
DEP Groundwater Classification	GAA - Groundwater used as a public drinking water supply, presumed to be drinkable without treatment
Size of Source Water Area	1660.0 acres
Location of Source Water Area	Coventry and Mansfield
Predominant Land Use and Land Cover in Source Water Area [b] -Urban - Commercial or Industrial -Urban - Residential -Agricultural -Undeveloped Land	 1.9 % 5.5 % 19.8 % 72.9 %
Preserved Land In Source Water Area [d]	91.6 acres
Significant Potential Contamination Sources -Number of inventoried facilities in source water area -Count of inventoried facilities per square mile -Number of contaminant sources within inventoried facilities	 2 0.77 per sq mile 2
Number of Contaminant Release Points Inventoried by CTDEP [c]	1

[a] Source water delineation method depends on data available for the wellfield

[b] Based on statewide data layer of land use and land cover developed by UCONN Dept of Natural Resource Management Engineering and Connecticut DEP satellite imagery.

[c] Sites or locations with documented accidental spills, leaks or discharges. While these sources, which are cataloged and tracked by the Connecticut DEP, may fall within a public drinking water supply source water area, they may or may not presently be discharging to the environment or causing contamination of a public drinking water source.

[d] Any combination of state forest and parklands and municipally or privately held land designated as open space.

APPENDIX E

Local Aquifer Protection Area Regulations

AQUIFER PROTECTION AREA REGULATIONS

OF THE

TOWN OF MANSFIELD, CONNECTICUT

First adopted: January 17, 2006
First effective: February 15, 2006
Revised effective: January 7, 2007

TABLE OF CONTENTS

Section 1

Title and Authority

A. Aquifers are an essential natural resource and a major source of public drinking water for the State of Connecticut. Use of groundwater will increase as the population grows and opportunities for new surface water supplies diminish due to the rising cost of land and increasingly intense development. At the same time, numerous drinking water wells have been contaminated by certain land use activities, and others are now threatened. To address this problem, Connecticut has established the Aquifer Protection Area Program (Connecticut General Statutes §22a-35bb) to identify critical water supply aquifers and to protect them from pollution by managing land use. Protection requires coordinated responsibilities shared by the state, municipality and water companies to ensure a plentiful supply of public drinking water fro present and future generations. It is therefore the purpose of these regulations to protect aquifer protection areas within the Town of Mansfield by making provisions for:

1. Implementing regulations consistent with state regulations and An Act Concerning Aquifer Protection Areas, Connecticut General Statutes §22a-354a to §22a-354bb ("the Act");
2. delineating aquifer protection areas on the city/town zoning or inland wetland and watercourse areas maps;
3. regulating land use activity within the aquifer protection area including: prohibiting certain new activities; registering existing regulated activities; and issuing permits for new regulated activities at registered facilities; and
4. administering and enforcing these regulations.

B. These regulations shall be known as the Aquifer Protection Area Regulations (the "APA Regulations") of the Town of Mansfield.

C. These regulations were adopted and may be amended, from time to time, in accordance with the provisions of §221-354p of An Act Concerning Aquifer Protection Areas, the Connecticut General Statutes §22a-354a to §22a-354bb and the Regulations of Connecticut State Agencies §22a-354i-l through §22a-354i-10.

D. The Planning and Zoning Commission of the Town of Mansfield is established as the Aquifer Protection Agency (the "Agency") in accordance with the "Ordinance for the Establishment of an Aquifer Protection Agency", (the "APA Ordinance"), effective July 10, 2004, and shall implement the purposes and provisions of the APA Ordinance and the Act.

E. The Agency shall administer all provisions of the Act and shall approve or deny registrations, issues permits, issue permits with terms, conditions or modifications, or deny permits for all regulated activities in aquifer protection areas in the Town of Mansfield, pursuant to the Act.

Section 2

Definitions

A. As used in these regulations, the following definitions apply:

1. “Affected water company” means “affected water company” as defined in §22a-354h of the Connecticut General Statutes;
2. “Agency” means the board or commission authorized by the municipality under §22a-354o of the Connecticut General Statutes;
3. “Agriculture” means “agriculture” as defined in the §1-1(q) of the Connecticut General Statutes;
4. “Applicant” means, as appropriate in context, a person who applies for an exemption under §22a-354i-6

of the Regulations of Connecticut State Agencies, a permit under §22a-354i-8 of the Regulations of Connecticut State Agencies or a permit under Section 9 of the APA Regulations;

5. "Application" means, as appropriate in context, an application for an exemption under §22a-354i-6 of the Regulations of Connecticut State Agencies, an application for a permit under §22a-354i-8 of the Regulations of Connecticut State Agencies or an application for a permit under Section 9 of the APA Regulations;

6. "Aquifer protection area" means "aquifer protection area" as defined in §22a-354h of the Connecticut General Statutes and any extension of such area approved by the Commissioner pursuant to §22a-354i-4 of the Regulations of Connecticut State Agencies;

7. "Area of contribution" means "area of contribution" as defined in §22a-354h of the Connecticut General Statutes and as mapped in accordance with §22a-354b-1 of the Regulations of Connecticut State Agencies;

8. "Bulk storage facility" means property where oil or petroleum liquids are received by tank vessel, pipeline, railroad car or tank vehicle for the purpose of storage for wholesale distribution;

9. "Certified Hazardous Materials Manager" means a hazardous materials manager certified by the Institute of Hazardous Materials Management and who is qualified by reason of relevant specialized training and relevant specialized experience to conduct audits of regulated activities to ensure compliance with applicable laws and identify appropriate pollution prevention practices for such activities;

10. "Commissioner" means the commissioner of environmental protection, or his or her agent;

11. "Domestic sewage" means "domestic sewage" as defined in §22a-430-3(a) the Regulations of Connecticut State Agencies;

12. "Facility" means property where a regulated activity is conducted by any person, including without limitation any buildings located on the property that are owned or leased by that person; and includes contiguous land owned, leased, or for which there is an option to purchase by that person;

13. "Floor drain" means any opening in a floor or surface which opening or surface receives materials spilled or deposited thereon;

14. "Hazardous material" means (A) any hazardous substance as defined in 40 CFR 302.4 and listed therein at Table 302.4, excluding mixtures with a total concentration of less than 1% hazardous substances based on volume, (B) any hazardous waste as defined in §22a-449(c)-101 of the Regulations of Connecticut State Agencies, (C) any pesticide as defined in §22a-47 of the Connecticut General Statutes, or (D) any oil or petroleum as defined in §22a-448 of the Connecticut General Statutes;

15. "Hazardous waste" means "hazardous waste" as defined in §22a-449(c)-101 of the Regulations of Connecticut State Agencies;

16. "Industrial laundry" means a facility for washing clothes, cloth or other fabric used in industrial operations;

17. "Infiltration device" means any discharge device installed below or above the ground surface that is designed to discharge liquid to the ground;

18. "Inland wetland and watercourse areas map" means a map pursuant to §22a-42a of the Connecticut General Statutes;

19. "ISO 14001 environmental management system certification" means a current ISO 14001 environmental management system certification issued by an ISO 14001 environmental management system registrar that is accredited by the ANSI-ASQ National Accreditation Board;

20. "Level A mapping" means the lines as shown on Level A maps approved or prepared by the

Commissioner pursuant to §22a-354c, §22a-354d or §22a-354z of the Connecticut General Statutes encompassing the area of contribution and recharge areas;

21. "Lubricating oil" means oil that contains less than 1% chlorinated solvents and is used for the sole purpose of lubricating, cutting, grinding, machining, stamping or quenching metals;
22. "Municipality" means "municipality" as defined in §22a-354h of the Connecticut General Statutes;
23. "Owner" means the owner or lessee of the facility in question;
24. "De-icing chemical" means sodium chloride, calcium chloride, or calcium magnesium acetate;
25. "Person" means any individual, firm, partnership, association, syndicate, company, trust, corporation, limited liability company, municipality, agency, political or administrative subdivision of the state, or other legal entity of any kind;
26. "Pollution" means “pollution” as defined in §22a-423 of the Connecticut General Statutes;
27. “Pollution prevention” means the use of processes and materials so as to reduce or minimize the amount of hazardous materials used or the quantity and concentration of pollutants in waste generated;
28. "Professional engineer" means a professional engineer licensed in accordance with chapter 391 of the Connecticut General Statutes, and who is qualified by reason of relevant specialized training and relevant specialized experience to conduct audits of regulated activities to ensure compliance with applicable law and identify appropriate pollution prevention practices for such activities;
29. "Publicly Owned Treatment Works” means “publicly owned treatment works” as defined in §22a-430-3 of the Regulations of Connecticut State Agencies;
30. "Public service company" means "public service company" as defined in §16-1 of the Connecticut General Statutes;
31. “Public supply well" means “public supply well” as defined in §19-13-B51b of the Regulations of Connecticut State Agencies;
32. "Recharge area" means “recharge area” as defined in §22a-354h of the Connecticut General Statutes and as mapped in accordance with §22a-354b-1 of the Regulations of Connecticut State Agencies;
33. “Registered regulated activity” means a regulated activity which has been registered under §22a-354i-7 of the Regulations of Connecticut State Agencies or Section 8 of the APA Regulations, and is conducted at the facility identified in such registration;
34. "Registrant" means a person, who or which, has submitted a registration for an existing regulated activity under §22a-354i-7 of the Regulations of Connecticut State Agencies or Section 4 of the APA Regulations;
35. "Regulated activity" means any of the following activities, which are located or conducted, wholly or partially, in an aquifer protection area, except as provided for in §22a-354i-5(c) and §22a-354i-6 of the Regulations of Connecticut State Agencies, or Section 4 of the APA Regulations:
    a. underground storage or transmission of oil or petroleum, to the extent such activity is not pre-empted by federal law, or hazardous material, except for (i) an underground storage tank that contains number two (2) fuel oil and is located more than five hundred (500) feet from a public supply well subject to regulation under §22a-354c or §22a-354z of the Connecticut General Statutes, or (ii) underground electrical facilities such as transformers, breakers, or cables containing oil for cooling or insulation purposes which are owned and operated by a public service company,
    b. oil or petroleum dispensing for the purpose of retail, wholesale or fleet use,
    c. on-site storage of hazardous materials for the purpose of wholesale sale,

d. repair or maintenance of vehicles or internal combustion engines of vehicles, involving the use, storage or disposal of hazardous materials, including solvents, lubricants, paints, brake fluids, transmission fluids or the generation of hazardous wastes,

e. salvage operations of metal or vehicle parts,

f. discharges to ground water other than domestic sewage, except for discharges from the following that have received a permit from the Commissioner: (i) a pump and treat system for ground water remediation, (ii) a potable water treatment system, (iii) heat pump system, (iv) non-contact cooling water system, (v) storm water discharge system, or (vi) swimming pools,

g. car or truck washing, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

h. production or refining of chemicals, including without limitation hazardous materials or asphalt,

i. clothes or cloth cleaning service which involves the use, storage or disposal of hazardous materials including without limitation dry-cleaning solvents,

j. industrial laundry activity that involves the cleaning of clothes or cloth contaminated by hazardous material, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

k. generation of electrical power by means of fossil fuels, except for (i) generation of electrical power by an emergency engine as defined by §22a-174-22(a)(2) of the Regulations of Connecticut State Agencies, or (ii) generation of electrical power by means of natural gas or propane,

l. production of electronic boards, electrical components, or other electrical equipment involving the use, storage or disposal of any hazardous material or involving metal plating, degreasing of parts or equipment, or etching operations,

m. embalming or crematory services which involve the use, storage or disposal of hazardous material, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

n. furniture stripping operations which involve the use, storage or disposal of hazardous materials,

o. furniture finishing operations which involve the use, storage or disposal of hazardous materials, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

p. storage, treatment or disposal of hazardous waste subject to a permit under §22a-449(c)-100 to §22a-449(c)-110, inclusive, of the Regulations of Connecticut State Agencies,

q. biological or chemical testing, analysis or research which involves the use, storage or disposal of hazardous material, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works, and provided that on-site testing of a public supply well by a public water utility is not a regulated activity,

r. pest control services which involve storage, mixing or loading of pesticides or other hazardous materials,

s. photographic finishing which involves the use, storage or disposal of hazardous materials, unless all waste water from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

t. production or fabrication of metal products which involves the use, storage or disposal of hazardous materials including (i) metal cleaning or degreasing with industrial solvents, (ii) metal plating, or (iii) metal etching,

u. printing, plate making, lithography, photoengraving, or gravure, which involves the use, storage or disposal of hazardous materials,

v. accumulation or storage of waste oil, anti-freeze or spent lead-acid batteries which are subject to a general permit issued under §22a-208(i) and §22a-454(e)(1) of the Connecticut General Statutes,

w. production of rubber, resin cements, elastomers or plastic, which involves the use, storage or disposal of hazardous materials,

x. storage of de-icing chemicals, unless such storage takes place within a weather-tight water-proof structure for the purpose of retail sale or for the purpose of de-icing parking areas or access roads to parking areas,

y. accumulation, storage, handling, recycling, disposal, reduction, processing, burning, transfer or composting of solid waste which is subject to a permit issued by the Commissioner pursuant to §22a-207b, §22a-208a, and §22a-208c of the Connecticut General Statute, except for a potable water treatment sludge disposal area,

z. dying, coating or printing of textiles, or tanning or finishing of leather, which activity involves the use, storage or disposal of hazardous materials,

aa. production of wood veneer, plywood, reconstituted wood or pressure-treated wood, which involves the use, storage or disposal of hazardous material, and

bb. pulp production processes that involve bleaching;

36. "Release" means "release" as defined in §22a-133k-1 of the Regulations of Connecticut State Agencies;
37. "State aquifer protection regulations" means §22a-354i-l to §22a-354i-40, inclusive, of the Regulations of Connecticut State Agencies;
38. "Storage" means the holding or possession of any hazardous material;
39. "Storage tank" means a stationary device which is designed to store hazardous materials, and is constructed of non-earthen materials including without limitation concrete, steel, fiberglass or plastic;
40. "Topographic feature" means an object, whether natural or man-made, located on the earth surface and of sufficient size that it appears on a 1:24,000 scale topographic quadrangle map drawn by the United States Geological Survey;
41. "Underground" when referring to a storage tank or storage tank component means that ten percent or more of the volumetric capacity of such tank or component is below the surface of the ground and that portion which is below the surface of the ground is not fully visible for inspection;
42. Vehicle" or "vehicles" means a "vessel" as defined by §15-170 of the Connecticut General Statues, and any vehicle propelled or drawn by any non-muscular power, including without limitation an automobile, aircraft, all-terrain vehicle, tractor, lawn mower or snowmobile.
43. "Waters" means "waters" as defined in §22a-423 of the Connecticut General Statutes;
44. "Well field" means "well field" as defined in §22a-354h of the Connecticut General Statutes; and
45. "Zoning District Map" means any map showing zoning districts prepared in accordance with maps adopted pursuant to §8-3 of the Connecticut General Statutes.

Section 3

Delineation of Aquifer Protection Area Boundaries

A. The Planning and Zoning Commission shall delineate the aquifer protection areas on the Town of Mansfield zoning map. Such delineation shall consist of the combined areas of contribution and recharge areas as shown on Level A maps approved or prepared by the Commissioner.

1. Such boundaries shall be delineated within one hundred twenty (120) days after being notified by the Commissioner that an aquifer protection area is located partially or entirely within the Town of Mansfield.

2. Notice of such delineation shall be published in a newspaper having substantial circulation in the affected area. Such notice shall include at least the following:

   a. a map or detailed description of the subject aquifer protection area; and

   b. the name, telephone number, and address of a representative of the Agency who may be reached for further information.

B. In order to clarify the location of an aquifer protection area boundary, the Agency may apply to the Commissioner to extend such boundary to coincide with the nearest property line, municipal boundary or topographic feature pursuant to §22a-354i-4 of the Regulations of Connecticut State Agencies. Such extension shall, at a minimum, fully encompass the aquifer protection areas bounded by the approved level A mapping but shall not exceed the distance necessary to clarify the location of the aquifer protection area or to facilitate the administration of regulations pertaining thereto. An aquifer protection area boundary may not be extended without prior written approval of the Commissioner.

1. Any request by the Agency to the Commissioner for extension of an aquifer protection area boundary shall include at least the following:

   a. A map to scale delineating (i) the aquifer protection area boundary mapped under section 3(a) of the APA regulations and (ii) the proposed extension of the aquifer protection area boundary;

   b. A certification by the chairperson or duly authorized agent of the Agency that notice of such request has been provided to all owners of property within the proposed extended aquifer protection area and all affected water companies in accordance with the following:

      1) Such notice shall include at least the following:

         a) A map showing the aquifer protection area boundaries and the proposed extension of such boundaries,

         b) the name, address, and telephone number of a representative of the Agency who may be contacted for further information, and

         c) a statement that any person may, not later than thirty (30) days after said notification, submit to the Agency written comments on such proposed boundary extension;

      2) Such notice shall be effectuated by the following:

         a) Delivery of notice by certified mail to those individuals and entities identified in subsection (b)(1)(B) of this section, or

         b) the publication of a notice in a newspaper having substantial circulation in the affected area; and posting of notice near the proposed boundaries of the subject aquifer protection area of at least four signs each of which shall be at least four square feet in size (2′ x 2′); and

      3) a summary of comments received by such Agency regarding the proposed boundary extension and the Agency’s response.

2. Not later than sixty (60) days after receiving the Commissioner's written approval of a request to extend an aquifer protection area boundary, the Agency shall cause such boundary to be delineated in accordance with subsection (a) of this section.

C. No person may challenge the boundaries of the aquifer protection area under the APA Regulations unless such challenge is based solely on a failure by the Agency to properly delineate the boundaries in accordance with §22a-354n of the Connecticut General Statutes.

D. A map of the location and boundaries of the aquifer protection areas, or regulated areas, shall be available for inspection in the Office of the City/Town Clerk or the Agency.

E. If the Level A mapping is amended in accordance with §22a-354b-1(i) or §22a-354b-1(j) of the Regulations of Connecticut State Agencies, the Agency shall cause the amended aquifer protection area boundary to be delineated in accordance with subsections (a) or (b) of this section.

Section 4

Prohibited and Regulated Activities

A. All regulated activities are prohibited in aquifer protection areas, except as specified in subsection (b) of this section.

B. The following regulated activities are not prohibited in aquifer protection areas:

   1. A registered regulated activity which is conducted in compliance with §22a-354i-9 of the Regulations of Connecticut State Agencies or section 12 of the APA Regulations; and

   2. a regulated activity which has received a permit issued pursuant to §22a-354i-8 of the Regulations of Connecticut State Agencies or section 9 of the APA Regulations.

C. The following are not regulated activities:

   1. Any activity conducted at a residence without compensation;

   2. any activity involving the use or storage of no more than two and one-half (2.5) gallons of each type of hazardous material on-site at any one time, provided the total of all hazardous materials on-site does not exceed fifty-five (55) gallons at any one time;

   3. any agricultural activity regulated pursuant to §22a-354m(d) of the Connecticut General Statutes;

   4. any activity provided all the following conditions are satisfied:

      a. such activity takes place solely within an enclosed building in an area with an impermeable floor,

      b. such activity involves no more than 10% of the floor area in the building where the activity takes place,

      c. any hazardous material used in connection with such activity is stored in such building at all times,

      d. all waste waters generated by such activity are lawfully disposed through a connection to a publicly owned treatment works, and

      e. such activity does not involve (i) repair or maintenance of internal combustion engines, including without limitation, vehicles, or equipment associated with such vehicles, (ii) underground storage of any hazardous material, or (iii) above ground storage of more than one hundred and ten (110) gallons of hazardous materials;

   5. any activity solely involving the use of lubricating oil provided all the following conditions are satisfied:

      a. such activity does not involve cleaning of metals with chlorinated solvents at the facility,

      b. such activity takes place solely within an enclosed building in an area with an impermeable floor,

      c. any hazardous material used in connection with such activity is stored in such building at all times, and

      d. such activity does not involve: (i) repair or maintenance of internal combustion engines, including without limitation, vehicles, or equipment associated with such vehicles, (ii) underground storage of any hazardous material, or (iii) above ground storage of more than one hundred ten (110) gallons of such lubricating oil and associated hazardous waste; and

6. any activity involving the dispensing of oil or petroleum from an above-ground storage tank or tanks with an aggregate volume of two thousand (2000) gallons or less provided all the following conditions are satisfied:

   a. such dispensing activity takes place solely on a paved surface which is covered by a roof,

   b. the above-ground storage tank(s) is a double-walled tank with overfill alarms, and

   c. all associated piping is either above ground, or has secondary containment.

D. Determination of a non-regulated activity

1. Any person proposing to carry out a non-regulated activity, as set forth in section 4(c) of these regulations, in an aquifer protection area shall, prior to commencement of such activity, notify the Agency or its duly authorized agent on a form provided by the Agency. Such form shall provide sufficient information to enable the Agency or its duly authorized agent to properly determine that the proposed activity is a regulated activity or a non-regulated activity within the aquifer protection area.

2. If such activity is determined to be a non-regulated activity, then no further action under the APA Regulations is necessary.

Section 5

Activities Regulated by the State

A. The Commissioner shall exclusively regulate activities within aquifer protection areas that are specified in §22a-354p(g) of the Connecticut General Statutes. The Agency shall regulate all other regulated activities.

B. Any person conducting regulated activities that are within the authority of the Commissioner shall submit a registration or obtain a permit or exemption from the Commissioner prior to engaging in such activity. The Commissioner shall process applications for those regulated activities.

C. The Agency may submit an advisory decision to the Commissioner for consideration on any permit regulated under this section in accordance with the Connecticut General Statutes §22a-354p(g).

Section 6

Application for an Exemption from Prohibition or Regulation

A. The owner or operator of a regulated activity may seek an exemption from the Commissioner pursuant to §22a-354i-6 of the Regulations of Connecticut State Agencies. Any person seeking an exemption from the Commissioner shall concurrently submit a copy of the application for an exemption to the Agency and any affected water company.

B. The Agency may submit written comments to the Commissioner on any exemption regulated under this section in accordance with §22a-354i-6(c) of the Regulations of Connecticut State Agencies within sixty (60) days of the agency receipt of copy of the application.

Section 7

General Registration, Permit Application and Transfer Procedures

A. All applications for permits and registrations shall contain sufficient information for a fair and informed determination of the issues. The Agency may request additional information from the applicant for this purpose.

B. The day of receipt of a registration, permit application or transfer form shall be the day of the next regularly scheduled meeting of the Agency, immediately following the day of submission of the application to the Agency or its duly authorized agent, or thirty-five days after such submission, whichever is sooner.

C. At any time during the review period, the Agency may require the applicant or registrant to provide additional information about the regulated activity. Requests for additional information shall not stay the time limitations for registrations and permits as set forth in sections 8 and 9 of the APA Regulations.

D. All permit applications and registrations shall be open for public inspection.

E. Incomplete permit applications and registrations may be denied without prejudice.

F. No permit or registration issued under sections 8 or 9 of the APA Regulations shall be assigned or transferred except with written approval by the Agency.

G. The Agency shall notify the town clerk of any adjoining municipality of the pendency of any application, petition, appeal, request or plan concerning any project on any site in which: (1) any portion of the property affected by a decision of such agency is within five-hundred feet of the boundary of the adjoining municipality; (2) a significant portion of the traffic to the completed project on the site will use streets within the adjoining municipality to enter or exit the site; (3) a significant portion of the sewer or water drainage from the project on the site will flow through and significantly impact the drainage or sewerage system within the adjoining municipality; or (4) water runoff from the improved site will impact streets or other municipal or private property within the adjoining municipality. Such notice shall be made by certified mail, return receipt requested, and shall be mailed within seven days of the date of receipt of the application, petition, request or plan. Such adjoining municipality may, through a representative, appear and be heard at any hearing on any such application, petition, appeal, request or plan.

Section 8

Registration Requirements

A. Any person engaged in a regulated activity which substantially commenced, or was in active operation within the past five (5) years, or with respect to which a municipal building permit was issued, either (A) before the effective date of the state aquifer protection regulations, or (B) before the date an applicable aquifer protection area is designated on a municipal zoning district map or inland wetland and watercourse areas map, whichever occurs later, shall register the activity in accordance with this section unless such person has pending an application for an exemption pursuant to §22a-354i-6 of the Regulations of Connecticut State Agencies.

1. The Commissioner shall process registrations for those regulated activities specified in §22a-354p(g) of the Connecticut General Statutes. The Agency shall process registrations for all other regulated activities.

2. If the regulated activity is not specified in §22a-354p(g) of the Connecticut General Statutes, the person engaged in such activity shall submit a registration to the Agency not later than one hundred eighty (180) days after adoption of regulations pursuant to §22a-354p of the Connecticut General Statutes, or the designation the aquifer protection area pursuant to §22a-354i-2 of the Regulations of Connecticut State Agencies, whichever occurs later. Said person shall simultaneously file a copy of the registration with the Commissioner, Commissioner of Public Health and the affected water company.

B. All registrations shall be provided on a form prescribed by the Agency and shall be accompanied by the correct registration fee in accordance with section 18 of the APA Regulations. Such registration forms may be obtained from the Agency. Such registration forms shall include at least the following information in writing or on maps or drawings:

1. The name, business telephone number, street address and mailing address of the:

   a. Registrant; if the registrant is a corporation or limited partnership, the full name of the facility and such corporation or limited partnership as registered with the Connecticut Secretary of State, and any officer or governing or managing body of any partnership, association, firm or corporation,

b. owner of such facility if different than the registrant, and

c. manager or operator overseeing the operations of such facility;

2. the location of such facility, using street address or other appropriate method of location, and a map showing the property boundaries of the facility on a 1:24,000 scale United States Geological Survey topographic quadrangle base;

3. an identification of the regulated activity or activities conducted at the facility, as described in 2(a)(35) of the APA Regulations, which regulated activity or activities shall consist of any regulated activity which substantially commenced, was in active operation, or with respect to which a municipal building permit was issued within the past five years; and

4. a certification by the registrant that the subject regulated activity is in compliance with the best management practices set forth in section 12(a) of the APA Regulations, as follows, signed after satisfying the statements set forth in the following certification:

> "I have personally examined and am familiar with the information submitted in this registration and all attachments, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in this document or certification may be punishable as a criminal offense under §53a-157b of the Connecticut General Statutes and any other applicable law."

C. When deemed necessary to protect a public supply well subject to regulation under §22a-354c or §22a-354z of the Connecticut General Statutes, the Agency may:

1. require, by written notice, any registrant to submit for review and written approval a storm water management plan prepared in accordance with section 12(b) of the APA Regulations. If so required, the storm water management plan shall be implemented by the registrant immediately upon its approval; or

2. require, by written notice, any registrant to submit for review and written approval the materials management plan prepared in accordance with section 12(a) of the APA Regulations. If so required, the materials management plan shall be implemented by the registrant immediately upon its approval.

D. If the Agency determines that a registration is incomplete, it shall reject the registration and notify the registrant of what additional information is required and the date by which it shall be submitted.

E. If the registration is determined to be complete, and the regulated activity is eligible for registration, the Agency shall send written notification of such registration to the registrant. Such registration shall be determined to be complete and eligible if the registrant has not otherwise received a notice of rejection from the Agency, not later than one hundred and eighty (180) days after the date the registration is received by the Agency.

F. The following general provisions shall be included in the issuance of all registrations:

1. The Agency has relied in whole or in part on information provided by the registrant and if such information subsequently proves to be false, deceptive, incomplete or inaccurate, the registration may be modified, suspended or revoked;

2. all registrations issued by the Agency are subject to and do not derogate any present or future rights or powers of the Commissioner, Agency, or municipality, and convey no rights in real estate or material nor any exclusive privileges, and are further subject to any and all public and private rights and to any federal, state, and municipal laws or regulations pertinent to the subject land or activity;

3. a complete registration shall expire five (5) years from the date of receipt of such registration by the

Agency;

4. the registrant shall apply to the Agency to renew the registration on a form prescribed by the Agency for a facility prior to expiration of such registration; and
5. If a registered regulated activity is out of business or inactive when registration renewal is required, a five (5) year allowance shall be in effect from the date the registration expires. If the registrant has not applied to renew the registration within five (5) years of the date the registration expires, the facility is no longer eligible for registration.

G. If a regulated activity which is eligible for registration in accordance with subsection (a) of this section fails to be registered or if the registrant of an active registered activity fails to apply for renewal prior to expiration, the Commissioner or municipal aquifer protection agency, as appropriate, may accept a late registration at their discretion, subject to the limitations in subsection (f)(5) of this section.

H. Any person wishing to assume the benefits under a registration for regulated activities shall apply to transfer such registration on a form prescribed by the Agency and submitted to the Agency.

Section 9

Permit Requirements

A. Any person may apply for a permit to add a regulated activity to a facility where a registered regulated activity occurs.

B. The Agency shall process permit applications for those registrants that have registered pursuant to section 8 of the APA Regulations. The Commissioner shall process permit applications for regulated activities specified in §22a-354p(g) of the Connecticut General Statutes and for those registrants that have registered pursuant to §22a-354i-7(b)(1) of the Regulations of Connecticut State Agencies.

C. Action shall be taken on permit applications within sixty-five (65) days after the completion of a public hearing or in the absence of a public hearing within sixty-five (65) days from the date of receipt of the application.

D. An application for a permit shall be made on a form prescribed by the Agency and shall be accompanied by the correct application fee in accordance with section 18 of the APA Regulations. Such permit application forms may be obtained from the Agency. Simultaneously with filing an application, the applicant shall send a copy of the application to the Commissioner, the Commissioner of Public Health and the affected water company. An application shall include the following information:

1. The information as required for a registration under section 8(b) of the APA Regulations shall be provided for the proposed regulated activity;
2. a confirmation and certification that the existing and proposed activity:
    a. remains and shall remain in compliance with section 12(a) of the APA Regulations,
    b. shall not increase the number of underground storage tanks used for storage of hazardous materials, and
    c. remains and shall remain in compliance with all local, state, and federal environmental laws;
3. a materials management plan in accordance with section 12(a) of the APA Regulations;
4. a storm water management plan in accordance with section 12(b) of the APA Regulations;
5. the following environmental compliance information with respect to environmental violations which occurred at the facility where the regulated activities are conducted, within the five years immediately preceding the date of the application:

a. any criminal conviction involving a violation of any environmental protection law,

b. any civil penalty imposed in any state or federal judicial proceeding, or any penalty exceeding five thousand dollars imposed in any administrative proceeding, and

c. any judicial or administrative orders issued regarding any such violation together with the dates, case or docket numbers, or other information which identifies the proceeding. For any such proceeding initiated by the state or federal government, the Agency may require submission of a copy of any official document associated with the proceeding, the final judgment or order;

6. any additional information deemed necessary by the Agency regarding potential threats to the ground water and proposed safeguards; and

7. the following certification signed by the applicant and the individual responsible for preparing the application, after satisfying the statements set forth in the certification:

"I have personally examined and am familiar with the information submitted in this document and all attachments, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information is punishable as a criminal offense under §53a-157b of the Connecticut General Statutes and any other applicable law."

E. The Commissioner, any affected water company or the Commissioner of Public Health may, not later than thirty (30) days after receiving a copy of an application for a permit under this section, submit to the Agency written comments on such application. The Agency shall give due consideration to any such comments, and shall provide a copy of the decision to the Commissioner, the affected water company and the Commissioner of Public Health.

F. To carry out the purposes of the Act, the Agency may grant an application as filed, grant it upon such terms, conditions, limitations or modifications necessary, or deny it. The Agency shall state upon the record the reason for its decision.

G. The Agency may hold a public hearing on an application for a permit in accordance with section 10 of the APA regulations.

H. The Agency shall not issue a permit unless a complete application has been received and the applicant demonstrates to the Agency's satisfaction that all requirements of this section of the APA regulations have been satisfied and all of the following standards and criteria have been met:

1. the proposed regulated activity shall take place at a facility where a registered regulated activity occurs;

2. the proposed regulated activity shall not increase the number, or storage capacity of underground storage tanks used for hazardous materials except for the replacement of an existing underground storage tank in accordance with section 12(a)(3) of the APA Regulations;

3. the materials management plan and storm water management plan have been satisfactorily prepared in accordance with sections 12(a) and 12(b) of the APA Regulations;

4. the applicant has submitted a confirmation and certification that all regulated activities remain and shall remain in compliance with all local, state and federal environmental laws in accordance with subsection (d)(2) of this section;

5. the applicant's compliance record does not indicate (A) that any noncompliance resulted from indifference to or disregard for the legal requirements, (B) an unwillingness or inability to devote the resources necessary to comply and remain in compliance, or (C) that instances of noncompliance have led to serious environmental harm, harm to human health or safety, or a substantial risk of such harm;

6. the proposed regulated activity shall be conducted in accordance with section 12 of the APA

Regulations;

7. the existing regulated activity is being conducted in accordance with section 12 of the APA Regulations; and
8. the certification required under subsection (d)(7) of this section has been signed by the applicant and the individual responsible for preparing the application.

I. The Agency may impose reasonable conditions or limitations on any permit issued under this section to assure protection of the ground water, including, but not limited to the following:

1. best management practices in addition to those set forth in section 12 of the APA Regulations; and
2. ground water monitoring.

J. The following general provisions shall be included in the issuance of all permits:

1. the Agency has relied in whole or in part on information provided by the applicant and if such information subsequently proves to be false, deceptive, incomplete or inaccurate, the permit may be modified, suspended or revoked;
2. all permits issued by the Agency are subject to and do not derogate any present or future rights or powers of the Commissioner, Agency, or municipality, and convey no rights in real estate or material nor any exclusive privileges, and are further subject to any and all public and private rights and to any federal, state, and municipal laws or regulations pertinent to the subject land or activity;
3. the permit shall expire ten (10) years from the date of issuance of such permit by the Agency; and
4. a person shall apply to the Agency to renew the permit on a form prescribed by the Agency prior to expiration of such permit. Such renewal shall be granted upon request by the Agency unless a substantial change in the permitted activity is proposed, or enforcement action with regard to the regulated activity has been taken, in which case, a new permit application shall be submitted and reviewed in accordance with the provisions of this section.

K. The Agency shall notify the applicant or permittee within fifteen (15) days of the date of the decision by certified mail, return receipt requested, and the Agency shall cause notice of its order in issuance or denial of a permit to be published in a newspaper having a general circulation in the municipality in which the aquifer protection area is located.

L. A permittee may request a modification of a permit from the Agency. Such request shall be on a form prescribed by the Agency, and shall include the facts and reasons supporting the request. The Agency may require the permittee to submit a new application for a permit or renewal in lieu of a modification request.

M. A person wishing to assume the benefits under a permit for regulated activities shall apply to transfer such permit on a form prescribed by the Agency and submitted to the Agency.

Section 10

Public Hearings Regarding Permit Applications

A. If the Agency decides to hold a public hearing regarding an application for a permit to conduct a regulated activity within an aquifer protection area, such hearing shall commence no later than sixty-five (65) days after the receipt of such application.

B. Notice of the hearing shall be published at least twice at intervals of not less than two (2) days, the first not more than fifteen (15) days and not fewer than ten (10) days, and the last not less than two (2) days before the date set for the hearing in a newspaper having a general circulation in each city/town where the affected aquifer, or any part thereof, is located.

C. The Agency shall send to any affected water company, at least ten (10) days before the hearing, a copy of the notice by certified mail, return receipt requested. Any affected water company may, through a representative, appear and be heard at any such hearing.

D. All applications, maps and documents relating thereto shall be open for public inspection.

E. At such hearing any person or persons may appear and be heard.

F. The hearing shall be completed within thirty-five (35) days of its commencement.

G. The applicant may consent to an extension of the time frames in Subsections (a) or (f) of this Section, provided the total extension of all such periods, including any extensions provided in Section 9(c), totals sixty-five (65) days or less.

H. In reaching its decision on any application after a public hearing, the Agency shall base its decision on the record of that hearing. Documentary evidence or other material not in the hearing record shall not be considered by the Agency in its decision.

I. The applicant or permittee shall be notified of the Agency's decision in accordance with section 9(k) of the APA Regulations.

Section 11

Bond and Insurance Relevant to Permit Applicants

A. An applicant may be required to file a bond as a condition of the permit.

B. Any bond or surety shall be conditioned on compliance with all provisions of these regulations and the terms, conditions and limitations established in the permit.

Section 12

Best Management Practices

A. Every regulated activity shall be conducted in accordance with the following:

1. hazardous materials may be stored above ground within an aquifer protection area only in accordance with the following conditions:

    a. hazardous material shall be stored in a building or under a roof that minimizes storm water entry to the hazardous material storage area, except that a roof is not required for a bulk storage facility as defined in section 2 of the APA Regulations,

    b. floors within a building or under a roof where hazardous material may be stored shall be constructed or treated to protect the surface of the floor from deterioration due to spillage of any such material,

    c. a structure which may be used for storage or transfer of hazardous material shall be protected from storm water run-on, and ground water intrusion,

    d. hazardous material shall be stored within an impermeable containment area which is capable of containing at least the volume of the largest container of such hazardous material present in such area, or 10% of the total volume of all such containers in such area, whichever is larger, without overflow of released hazardous material from the containment area,

    e. hazardous material shall not be stored with other hazardous materials that are incompatible and may create a hazard of fire, explosion or generation of toxic substances,

    f. hazardous material shall be stored only in a container that has been certified to meet state or federal specifications for containers suitable for the transport or storage of such material,

g. hazardous material shall be stored only in an area that is secured against un-authorized entry by the public, and

h. the requirements of this subdivision are intended to supplement, and not to supersede, any other applicable requirements of federal, state, or local law, including applicable requirements of the Resource Conservation and Recovery Act of 1976;

2. no person shall increase the number of underground storage tanks used to store hazardous materials;

3. an underground storage tank used to store hazardous materials shall not be replaced with a larger tank unless (A) there is no more than a 25% increase in volume of the larger replacement tank, and (B) the larger replacement tank is a double-walled tank with co-axial piping, both meeting new installation component standards pursuant to §22a-449(d)-1(e) and §22a-449(d)-102 of the Regulations of Connecticut State Agencies, and with interstitial monitoring;

4. no person shall use, maintain or install floor drains, dry wells or other infiltration devices or appurtenances which allow the release of waste waters to the ground, unless such release is permitted by the Commissioner in accordance with §22a-430 or §22a-430b of the Connecticut General Statutes; and

5. a materials management plan shall be developed and implemented in accordance with the following:

   a. a materials management plan shall contain, at a minimum, the following information with respect to the subject regulated activity:

      1) a pollution prevention assessment consisting of a detailed evaluation of alternatives to the use of hazardous materials or processes and practices that would reduce or eliminate the use of hazardous materials, and implementation of such alternatives where possible and feasible,

      2) §22a a description of any operations or practices which may pose a threat of pollution to the aquifer, which shall include the following:

         a) a process flow diagram identifying where hazardous materials are stored, disposed and used, and where hazardous wastes are generated and subsequently stored and disposed,

         b) an inventory of all hazardous materials which are likely to be or will be manufactured, produced, stored, utilized or otherwise handled, and

         c) a description of waste, including waste waters generated, and a description of how such wastes are handled, stored and disposed,

      3) the name, street address, mailing address, title and telephone number of the individual(s) responsible for implementing the materials management plan and the individual(s) who should be contacted in an emergency,

      4) a record-keeping system to account for the types, quantities, and disposition of hazardous materials which are manufactured, produced, utilized, stored, or otherwise handled or which are discharged or emitted; such record-keeping system shall be maintained at the subject facility and shall be made available thereat for inspection during normal business hours by the Commissioner and the municipal aquifer protection agency, and

      5) an emergency response plan for responding to a release of hazardous materials. Such plan shall describe how each such release could result in pollution to the underlying aquifer and shall set forth the methods used or to be used to prevent and abate any such a release;

(B) when a materials management plan is required under either section 8(c) or 9(d) of the APA Regulations, such materials management plan shall be completed and certified by a professional engineer or a certified hazardous materials manager, or, if the facility where the regulated activity is conducted has received and maintained an ISO 14001 environmental management system certification, then the registrant may complete and certify the materials management plan; and

(C) the materials management plan shall be maintained at the subject facility and shall be made available thereat for inspection during normal business hours by the Commissioner and the municipal aquifer protection agency.

B. The development and implementation of a storm water management plan required for regulated activities in accordance with sections 8(c) and 9(d) of the APA Regulations, shall be as follows: A storm water management plan shall assure that storm water run-off generated by the subject regulated activity is (i) managed in a manner so as to prevent pollution of ground water, and (ii) shall comply with all of the requirements for the General Permit of the Discharge of Storm Water associated with a Commercial Activity issued pursuant to §22a-430b of the Connecticut General Statutes.

Section 13

Other State, Federal and Local Laws

A. Nothing in these regulations shall obviate the requirement for the applicant to obtain any other assents, permits or licenses required by law or regulation by the Town of Mansfield, State of Connecticut and the Government of the United States including any approval required by the Connecticut Department of Environmental Protection and the U.S. Army Corps of Engineers and the United States Environmental Protection Agency. Obtaining such assents, permits or licenses are the sole responsibility of the applicant.

B. No person shall conduct any regulated activity within an aquifer protection area which requires zoning or subdivision approval without first having obtained a valid certificate of zoning or subdivision approval, special permit, special exception or variance, or other documentation establishing that the proposal complies with the Town of Mansfield zoning or subdivision regulations.

Section 14

Enforcement

A. The Agency may appoint a duly authorized agent to act in its behalf with the authority to issue notices of violation or cease and desist orders.

B. If the Agency or its duly authorized agent finds that any person is conducting or maintaining any activity, facility or condition which violates any provision of these regulations, the Agency or its duly authorized agent may:

1. Issue a notice of violation.

   a. The notice of violation shall state the nature of the violation, the jurisdiction of the Agency, and the necessary action required to correct the violation including without limitation halting the activity in the aquifer protection area.

   b. The Agency may request that the person appear at the next regularly scheduled meeting of the Agency to discuss the unauthorized activity, and/or provide a written reply to the notice or file an application for the necessary permit or registration. Failure to carry out the action(s) directed in a notice of violation may result in issuance of an order under subsection (2) of this section or other enforcement proceedings as provided by law.

2. Issue a written order.

   a. Such order shall be issued by certified mail, return receipt requested to such person conducting such activity or maintaining such facility or condition to cease such activity immediately or to correct such facility or condition. The Agency shall send a copy of such order to any affected water company by certified mail, return receipt requested.

   b. Within ten (10) days of the issuance of such order the Agency shall hold a hearing to provide the person an opportunity to be heard and show cause why the order should not remain in effect. Any affected water company may testify at the hearing. The Agency shall consider the facts presented at the hearing and, within ten (10) days of the completion of the hearing, notify the person by certified mail, return receipt requested, that the original order remains in effect, that a revised order is in effect, or that the order has been withdrawn.

3. Suspend or revoke registration or permit.

    a. The Agency may suspend or revoke a registration or a permit if it finds, after a hearing, that the registrant or permittee has not complied with the terms, conditions or limitations set forth in the registration or the permit. Prior to revoking or suspending any registration or permit, the Agency shall issue notice to the registrant or the permittee, personally or by certified mail, return receipt requested, setting forth the facts or conduct that warrants the intended action.

    b. The Agency shall hold a hearing to provide the registrant or permittee an opportunity to show that it is in compliance with its registration or permit. The Agency shall notify the registrant or permittee of its decision by certified mail within fifteen (15) days of the date of its decision. The Agency shall publish notice of a suspension or revocation in a newspaper having general circulation in the Town of Mansfield.

C. An order issued pursuant to subsection (b)(2) shall be effective upon issuance, shall remain in effect until the Agency affirms, revises, or withdraws the order, and shall not delay or bar an action pursuant to subsection (b)(3) of this section.

D. A court may assess criminal and or civil penalties to any person who commits, takes part in, or assists in any violation of any provision of the APA regulations in accordance with §22a-354s(b) and §22a-354s(c) of the Connecticut General Statutes.

Section 15

Amendments

A. These regulations may be amended, changed or repealed in accordance with §22a-354p(b) of the Connecticut General Statutes.

B. If a complete application is filed with the Agency which is in conformance with the APA regulations as of the date of its filing, the permit issued shall not be required to comply with any changes in regulations taking effect on or after the date that the filing date. The provisions of this section shall not apply to the establishment, amendment, or change of the boundaries of the aquifer protection area or to any changes in the APA Regulations necessary to make the regulations consistent with chapter 446i of the Connecticut General Statutes as of the date of the Agency's decision.

Section 16

Appeals

A. Appeal of the Agency's regulation, order, decision or action shall be made in accordance with §22a-354q of the Connecticut General Statutes.

Section 17

Conflict and Severance

A. If there is a conflict between the provisions of the APA Regulations, the provision that imposes the most stringent standards shall govern. The invalidity of any word, clause, sentence, section, part, subsection, subdivision or provision of these regulations shall not affect the validity of any other part that can be given effect without such valid part or parts.

B. If there is a conflict between the provisions of the APA Regulations and the Act, the provisions of the Act shall govern.

Section 18

Registration and Permit Application Fees

A. All fees required by these regulations shall be submitted to the Agency by certified check or money order payable to the Town of Mansfield at the time the registration or permit application is filed with the Agency.

B. No registration or permit application shall be granted or approved by the Agency unless the correct registration/application fee is paid in full or unless a waiver has been granted by the Agency pursuant to subsection (f) of this section.

C. The registration or permit application fee is nonrefundable.

D. Registration or permit application fees shall be based on the following schedule:

Fee Schedule			
	Facility Size		
	Small (< 1 acre)	Medium (1-5 acres)	Large (> 5 acres)
Registrations:			
Industrial	$250	$400	$600
Commercial	$250	$400	$600
Other	$250	$400	$600
Permits:			
Industrial	$500	$750	$1,000
Commercial	$500	$750	$1,000
Other	$500	$750	$1,000
Materials Management Plan Reviews	$150	$150	$150
Storm water Management Plan Reviews	$150	$150	$150
Public Hearing	$200	$200	$200
Facility Inspection/Monitoring	$150	$150	$150
Regulation Petition	$250	$250	$250

E. Boards, commissions, councils and departments of the Town of Mansfield are exempt from all fee requirements.

F. The registrant or applicant may petition the Agency to waive, reduce or allow delayed payment of the fee. Such petitions shall be in writing and shall state fully the facts and circumstances the Agency should consider in its determination under this section. The Agency may waive all or part of the application fee if the Agency determines that:

1. the activity applied for would clearly result in a substantial public benefit to the environment or to the public health and safety and the registrant or applicant would reasonably be deterred from initiating the activity solely or primarily as a result of the amount of the registration or permit application fee; or

2. the amount of the registration or permit application fee is clearly excessive in relation to the cost to the

City/Town for reviewing and processing the application.

G. Extra Assessments

In the event that additional expenses, including but not limited to outside consultants, experts, or legal advisors are incurred in processing the registration or permit application the applicant/ registrant may be assessed an additional fee not to exceed $2,000 to cover said costs. Said fees are to be estimated by the duly authorized agent and submitted with the application fee and held until the application is completely processed after which time any residual funds pertaining to this assessment are to be returned to the applicant/registrant.

For the purpose of this assessment, an "outside consultant" means a professional who is not an employee of the Town of Mansfield including but not limited to engineering, environmental, hydrogeology and hazardous materials management professionals.

The Agency shall state upon its record the basis for all actions under this section.

Section 19

Effective Date of Regulations

The APA Regulations, APA boundaries and amendments thereto, shall become effective upon (1) the Commissioner's determination that such regulations are reasonably related to the purpose of ground water protection and not inconsistent with the Regulations of Connecticut State Agencies §22a-354i-1 through §22a-354i-10 and (2) filing in the Office of the Town Clerk.

Effective Date: February 15, 2006

Town of Willington

Inland Wetlands and Watercourses Agency

Aquifer Protection Regulations

for the protection of CT State delineated Aquifers

adopted 6-22-09
effective 7-1-09

Town of Willington
Aquifer Protection Regulations

Effective Date:

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Model Municipal Regulations
Aquifer Protection Areas

SECTION 1. Title and Authority

(a) Aquifers are an essential natural resource and a major source of public drinking water for the State of Connecticut. Use of groundwater will increase as the population grows and opportunities for new surface water supplies diminish due to the rising cost of land and increasingly intense development. At the same time, numerous drinking water wells have been contaminated by certain land use activities, and others are now threatened. To address this problem, Connecticut has established the Aquifer Protection Area Program (Connecticut General Statutes §22a-354a to §22a-354bb) to identify critical water supply aquifers and to protect them from pollution by managing land use. Protection requires coordinated responsibilities shared by the state, municipality and water companies to ensure a plentiful supply of public drinking water for present and future generations. It is therefore the purpose of these regulations to protect aquifer protection areas within the Town of Willington by making provisions for:

(1) implementing regulations consistent with state regulations and An Act Concerning Aquifer Protection Areas, Connecticut General Statutes §22a-354a to §22a-354bb ("the Act");

(2) delineating aquifer protection areas on the city/town zoning or inland wetland and watercourse areas maps;

(3) regulating land use activity within the aquifer protection area including: prohibiting certain new activities; registering existing regulated activities; and issuing permits for new regulated activities at registered facilities; and

(4) administering and enforcing these regulations.

(b) These regulations shall be known as the Aquifer Protection Area Regulations (the "APA Regulations") of the Town of Willington

(c) These regulations were adopted and may be amended, from time to time, in accordance with the provisions of §22a-354p of An Act Concerning Aquifer Protection Areas, the Connecticut General Statutes §22a-354a to §22a-354bb and the Regulations of Connecticut State Agencies §22a-354i-1 through §22a-354i-10.

(d) The Inland Wetlands Commission of the /Town of Willington is established as the Aquifer Protection Agency (the "Agency") in accordance with the "Ordinance for the Establishment of an Aquifer Protection Agency," (the "APA Ordinance") effective May, 5 2004, and shall implement the purposes and provisions of the APA Ordinance and the Act.

(e) The Agency shall administer all provisions of the Act and shall approve or deny registrations, issue permits, issue permits with terms, conditions, limitations or modifications, or deny permits for all regulated activities in aquifer protection areas in the Town of Willington pursuant to the Act.

SECTION 2. Definitions

(a) As used in these regulations, the following definitions apply:

(1) "Affected water company" means “affected water company” as defined in §22a-354h of the Connecticut General Statutes. Presently, § 22a-354h defines “affected water company” as “any public or private water company owning or operating a public water supply well within an aquifer protection area”;

(2) “Agency” means the board or commission authorized by the municipality under §22a-354o of the Connecticut General Statutes (*i.e.* the Willington Inland Wetlands and Watercourses Commission);

(3) “Agriculture” means “agriculture” as defined in the §1-1(q) of the Connecticut General Statutes. Presently, § 1-1(q) defines “agriculture” as including “cultivation of the soil, dairying, forestry, raising or harvesting any agricultural or horticultural commodity, including the raising, shearing, feeding, caring for, training and management of livestock, including horses, bees, poultry, fur-bearing animals and wildlife, and the raising or harvesting of oysters, clams, mussels, other molluscan shellfish or fish; the operation, management, conservation, improvement or maintenance of a farm and its buildings, tools and equipment, or salvaging timber or cleared land of brush or other debris left by a storm, as an incident to such farming operations; the production or harvesting of maple syrup or maple sugar, or any agricultural commodity, including lumber, as an incident to ordinary farming operations or the harvesting of mushrooms, the hatching of poultry, or the construction, operation or maintenance of ditches, canals, reservoirs or waterways used exclusively for farming purposes; handling, planting, drying, packing, packaging, processing, freezing, grading, storing or delivering to storage or to market, or to a carrier for transportation to market, or for direct sale, any agricultural or horticultural commodity as an incident to ordinary farming operations, or, in the case of fruits and vegetables, as an incident to the preparation of such fruits or vegetables for market or for direct sale;

(4) "Applicant" means, as appropriate in context, a person who applies for an exemption under §22a-354i-6 of the Regulations of Connecticut State Agencies, a permit under §22a-354i-8 of the Regulations of Connecticut State Agencies or a permit under Section 9 of the APA Regulations;

(5) "Application” means, as appropriate in context, an application for an exemption under §22a-354i-6 of the Regulations of Connecticut State Agencies, an application for a permit under §22a-354i-8 of the Regulations of Connecticut State Agencies or an application for a permit under Section 9 of the APA Regulations;

(6) "Aquifer protection area" means "aquifer protection area" as defined in §22a-354h of the Connecticut General Statutes and any extension of such area approved by the Commissioner pursuant to §22a-354i-4 of the Regulations of Connecticut State Agencies. Presently, § 22a-354h defines “aquifer protection area” means “any area consisting of well fields, areas of contribution and recharge areas, identified on maps approved by the commissioner of environmental protection pursuant to sections 22a-354b to 22a-354d, inclusive, within which land uses or activities shall be required to comply with regulations adopted pursuant to sections 22a-354o by the municipality where the aquifer protection area is located”;

(7) "Area of contribution" means "area of contribution" as defined in §22a-354h of the Connecticut General Statutes and as mapped in accordance with §22a-354b-1 of the Regulations of Connecticut State Agencies. Presently § 22a-354h defines “area of contribution” as “the area where the water table or other potentiometric surface is lowered due to the pumping of a well and groundwater flows directly to the well”;

(8) "Bulk storage facility" means property where oil or petroleum liquids are received by tank vessel, pipeline, railroad car or tank vehicle for the purpose of storage for wholesale distribution;

(9) “Certified Hazardous Materials Manager” means a hazardous materials manager certified by the Institute of Hazardous Materials Management and who is qualified by reason of relevant specialized training and relevant specialized experience to conduct audits of regulated activities to ensure compliance with applicable laws and identify appropriate pollution prevention practices for such activities;

(10) "Commissioner" means the commissioner of environmental protection, or his or her agent;

(11) "Domestic sewage" means "domestic sewage" as defined in §22a-430-3(a) the Regulations of Connecticut State Agencies. Presently, § 22a-430-3(a) defines “domestic sewage” as “sewage that consists of water and human excretions or other waterborne wastes incidental to the occupancy of residential buildings or non-residential buildings but not including manufacturing process water, cooling water, wastewater from water softening equipment, commercial laundry wastewater, blowdown from heating or cooling equipment, water from cellar or floor drains or surface water from roofs, paved surfaces or yard drains”;

(12) "Facility" means property where a regulated activity is conducted by any person, including without limitation any buildings located on the property that are owned or leased by that person; and includes contiguous land owned, leased, or for which there is an option to purchase by that person;

(13) "Floor drain" means any opening in a floor or surface which opening or surface receives materials spilled or deposited thereon;

(14) "Hazardous material" means (A) any hazardous substance as defined in 40 CFR 302.4 and listed therein at Table 302.4, excluding mixtures with a total concentration of less

than 1% hazardous substances based on volume, (B) any hazardous waste as defined in §22a-449(c)-101 of the Regulations of Connecticut State Agencies, (C) any pesticide as defined in §22a-47 of the Connecticut General Statutes, or (D) any oil or petroleum as defined in §22a-448 of the Connecticut General Statutes;

(15) "Hazardous waste" means "hazardous waste" as defined in §22a-449(c)-101 of the Regulations of Connecticut State Agencies. Presently Section 22a-449(c)-101 of the Regulations of Connecticut State Agencies defines hazardous wastes as follows: Hazardous waste means a solid, liquid or gaseous waste that meets one of the following conditions: (1) Is <u>listed</u> in Subpart D of 40 CFR 261; (2) Exhibits a <u>characteristic</u> defined in Subpart C of 40 CFR part 261 that include ignitability, corrosivity, reactivity and toxicity; (3) Is a <u>mixture</u> containing a listed hazardous waste and a non-hazardous solid waste; (4) Is <u>derived from</u> storage, treatment or disposal of a hazardous waste (For example: leachate is derived from disposal); (5) Is <u>not excluded</u> from regulation as a hazardous waste (Exclusions are limited and include very specific wastes treated in specific ways. For example: wastewater treatment plant sludges generated from electroplating operations and stored in on-site land fill);

(16) "Industrial laundry" means a facility for washing clothes, cloth or other fabric used in industrial operations;

(17) "Infiltration device" means any discharge device installed below or above the ground surface that is designed to discharge liquid to the ground;

(18) "Inland wetland and watercourse areas map" means a map pursuant to §22a-42a of the Connecticut General Statutes;

(19) "ISO 14001 environmental management system certification" means a current ISO 14001 environmental management system certification issued by an ISO 14001 environmental management system registrar that is accredited by the American National Standards Institute (ANSI) - American Society for Quality (ASQ) National Accreditation Board (ANAB);

(20) "Level A mapping" means the lines as shown on Level A maps approved or prepared by the Commissioner pursuant to §22a-354c, §22a-354d or §22a-354z of the Connecticut General Statutes encompassing the area of contribution and recharge areas;

(21) "Lubricating oil" means oil that contains less than 1% chlorinated solvents and is used for the sole purpose of lubricating, cutting, grinding, machining, stamping or quenching metals;

(22) "Municipality" means "municipality" as defined in §22a-354h of the Connecticut General Statutes. Presently § 22a-354h defines "municipality" as "any town, consolidated town and city, consolidated town and borough, city or borough";

(23) "Owner" means the owner or lessee of the facility in question;

(24) "De-icing chemical" means sodium chloride, calcium chloride, or calcium magnesium acetate;

(25) "Person" means any individual, firm, partnership, association, syndicate, company, trust, corporation, limited liability company, municipality, agency, political or administrative subdivision of the state, or other legal entity of any kind;

(26) "Pollution" means “pollution” as defined in §22a-423 of the Connecticut General Statutes. Presently, § 22a-423 defines “pollution” as “harmful thermal effect or the contamination or rendering unclean or impure of any waters of the state by reason of any waste or other materials discharged or deposited therein by any public or private sewer or otherwise so directly or indirectly to come in contact with any waters. This includes, but is not limited to, erosion and sedimentation resulting from any filling, land clearing or excavation activity”;

(27) “Pollution prevention” means the use of processes and materials so as to reduce or minimize the amount of hazardous materials used or the quantity and concentration of pollutants in waste generated;

(28) "Professional engineer" means a professional engineer licensed in accordance with Chapter 391 of the Connecticut General Statutes, and who is qualified by reason of relevant specialized training and relevant specialized experience to conduct audits of regulated activities to ensure compliance with applicable law and identify appropriate pollution prevention practices for such activities;

(29) "Publicly Owned Treatment Works” means “publicly owned treatment works” as defined in §22a-430-3 of the Regulations of Connecticut State Agencies. Presently, § 22a-430-3 defines “publically owned treatment works” as “a system used for the collection, treatment, and/or disposal of sewage from more than one lot as defined in section 22a-430-1 of the Regulations of the Connecticut State Agencies and which discharges to the waters of the state and which is owned by a municipality or the state”;

(30) "Public service company" means "public service company" as defined in §16-1 of the Connecticut General Statutes. Presently, § 16-1 defines “public service company” as including “electric, electric distribution, gas, telephone, telegraph, pipeline, sewage, water and community antenna television companies, owning, leasing, maintaining, operating, managing or controlling plants or parts of plants or equipment, and all express companies having special privileges on railroads within this state, but shall not include telegraph company functions concerning intrastate money order service, towns, cities, boroughs, any municipal corporation or department thereof, whether separately incorporated or not, a private power producer, as defined in section 16-243b, or an exempt wholesale generator, as defined in 15 USC 79z-5a”;

(31) “Public supply well" means “public supply well” as defined in §19-13-B51b of the Regulations of Connecticut State Agencies. Presently, § 19-13-B51b defines “public supply well” as “a water supply well used or made available by a water company to

two or more consumers, as defined in section 25-32a of the 1969 supplement to the general statutes";

(32) "Recharge area" means "recharge area" as defined in §22a-354h of the Connecticut General Statutes and as mapped in accordance with §22a-354b-1 of the Regulations of Connecticut State Agencies. Presently, § 22a-354h defines "recharge area" as the area from which groundwater flows directly to the area of contribution";

(33) "Registered regulated activity" means a regulated activity which has been registered under §22a-354i-7 of the Regulations of Connecticut State Agencies or Section 8 of the APA Regulations, and is conducted at the facility identified in such registration;

(34) "Registrant" means a person, who or which, has submitted a registration for an existing regulated activity under §22a-354i-7 of the Regulations of Connecticut State Agencies or Section 4 of these Regulations;

(35) "Regulated activity" means any of the following activities, which are located or conducted, wholly or partially, in an aquifer protection area, except as provided for in §22a-354i-5(c) and §22a-354i-6 of the Regulations of Connecticut State Agencies, or Section 4 of the APA Regulations:

(A) underground storage or transmission of oil or petroleum, to the extent such activity is not pre-empted by federal law, or hazardous material, except for (i) an underground storage tank that contains number two (2) fuel oil and is located more than five hundred (500) feet from a public supply well subject to regulation under §22a-354c or §22a-354z of the Connecticut General Statutes, or (ii) underground electrical facilities such as transformers, breakers, or cables containing oil for cooling or insulation purposes which are owned and operated by a public service company,

(B) oil or petroleum dispensing for the purpose of retail, wholesale or fleet use,

(C) on-site storage of hazardous materials for the purpose of wholesale sale,

(D) repair or maintenance of vehicles or internal combustion engines of vehicles, involving the use, storage or disposal of hazardous materials, including solvents, lubricants, paints, brake fluids, transmission fluids or the generation of hazardous wastes,

(E) salvage operations of metal or vehicle parts,

(F) wastewater discharges to ground water other than domestic sewage and stormwater, except for discharges from the following that have received a permit from the Commissioner pursuant to §22a-430 of the Connecticut General Statutes: (i) a pump and treat system for ground water remediation, (ii) a potable water treatment system, (iii) heat pump system, (iv) non-contact cooling water system, (v) swimming pools,

(G) car or truck washing, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

(H) production or refining of chemicals, including without limitation hazardous materials or asphalt,

(I) clothes or cloth cleaning service which involves the use, storage or disposal of hazardous materials including without limitation dry-cleaning solvents,

(J) industrial laundry activity that involves the cleaning of clothes or cloth contaminated by hazardous material, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

(K) generation of electrical power by means of fossil fuels, except for (i) generation of electrical power by an emergency engine as defined by §22a-174-22(a)(2) of the Regulations of Connecticut State Agencies, or (ii) generation of electrical power by means of natural gas or propane,

(L) production of electronic boards, electrical components, or other electrical equipment involving the use, storage or disposal of any hazardous material or involving metal plating, degreasing of parts or equipment, or etching operations,

(M) embalming or crematory services which involve the use, storage or disposal of hazardous material, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

(N) furniture stripping operations which involve the use, storage or disposal of hazardous materials,

(O) furniture finishing operations which involve the use, storage or disposal of hazardous materials, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

(P) storage, treatment or disposal of hazardous waste subject to a permit under §22a-449(c)-100 to §22a-449(c)-110, inclusive, of the Regulations of Connecticut State Agencies,

(Q) biological or chemical testing, analysis or research which involves the use, storage or disposal of hazardous material, unless all waste waters from such activity are lawfully disposed of through a connection to a publicly owned treatment works, and provided that on-site testing of a public supply well by a public water utility is not a regulated activity,

(R) pest control services which involve storage, mixing or loading of pesticides or other hazardous materials,

(S) photographic finishing which involves the use, storage or disposal of hazardous materials, unless all waste water from such activity are lawfully disposed of through a connection to a publicly owned treatment works,

(T) production or fabrication of metal products which involves the use, storage or disposal of hazardous materials including (i) metal cleaning or degreasing with industrial solvents, (ii) metal plating, or (iii) metal etching,

(U) printing, plate making, lithography, photoengraving, or gravure, which involves the use, storage or disposal of hazardous materials,

(V) accumulation or storage of waste oil, anti-freeze or spent lead-acid batteries which are subject to a general permit issued by the Commissioner under §22a-208(i) and §22a-454(e)(1) of the Connecticut General Statutes,

(W) production of rubber, resin cements, elastomers or plastic, which involves the use, storage or disposal of hazardous materials,

(X) storage of de-icing chemicals, unless such storage takes place within a weather-tight water-proof structure for the purpose of retail sale or for the purpose of de-icing parking areas or access roads to parking areas,

(Y) accumulation, storage, handling, recycling, disposal, reduction, processing, burning, transfer or composting of solid waste which is subject to a permit issued by the Commissioner pursuant to §22a-207b, §22a-208a, and §22a-208c of the Connecticut General Statute, except for a potable water treatment sludge disposal area,

(Z) dying, coating or printing of textiles, or tanning or finishing of leather, which activity involves the use, storage or disposal of hazardous materials,

(AA) production of wood veneer, plywood, reconstituted wood or pressure-treated wood, which involves the use, storage or disposal of hazardous material, and

(BB) pulp production processes that involve bleaching;

(36) "Release" means "release" as defined in §22a-133k-1 of the Regulations of Connecticut State Agencies. Presently, § 22a-133k-1(a)(50) defines "release" as "any discharge, spillage, uncontrolled loss, seepage, filtration, leakage, injection, escape, dumping, pumping, pouring, emitting, emptying, or disposal of a substance";

(37) "State aquifer protection regulations" means §22a-354i-1 to §22a-354i-10, inclusive, of the Regulations of Connecticut State Agencies;

(38) "Storage" means the holding or possession of any hazardous material;

(39) "Storage tank" means a stationary device which is designed to store hazardous materials, and is constructed of non-earthen materials including without limitation

concrete, steel, fiberglass or plastic;

(40) "Topographic feature" means an object, whether natural or man-made, located on the earth surface and of sufficient size that it appears on a 1:24,000 scale topographic quadrangle map drawn by the United States Geological Survey;

(41) "Underground" when referring to a storage tank or storage tank component means that ten percent or more of the volumetric capacity of such tank or component is below the surface of the ground and that portion which is below the surface of the ground is not fully visible for inspection;

(42) “Vehicle” or "vehicles" means a “vessel” as defined by §15-170 of the Connecticut General Statutes, and any vehicle propelled or drawn by any non-muscular power, including without limitation an automobile, aircraft, all-terrain vehicle, tractor, lawn mower or snowmobile. Presently, §15-170 defines "vessel" as “every description of watercraft, other than a seaplane on water, used or capable of being used as a means of transportation on water”;

(43) "Waters” means “waters” as defined in §22a-423 of the Connecticut General Statutes. Presently, § 22a-423 defines "waters" as “all tidal waters, harbors, estuaries, rivers, brooks, watercourses, waterways, wells, springs, lakes, ponds, marshes, drainage systems and all other surface or underground streams, bodies or accumulations of water, natural or artificial, public or private, which are contained within, flow through or border upon this state or any portion thereof.”;

(44) "Well field" means “well field” as defined in §22a-354h of the Connecticut General Statutes. Presently, § 22a-354h defines “well field” as “the immediate area surrounding a public drinking water supply well or group of wells”; and

(45) "Zoning district map" means any map showing zoning districts prepared in accordance with maps adopted pursuant to §8-3 of the Connecticut General Statutes.

SECTION 3. Delineation of Aquifer Protection Area Boundaries

(a) The Willingon Planning and Zoning Commission shall delineate the aquifer protection areas on the Town of Willington zoning district map. Such delineation shall consist of the combined areas of contribution and recharge areas as shown on Level A maps approved or prepared by the Commissioner.

(1) Such boundaries shall be delineated within one hundred twenty (120) days after being notified by the Commissioner that an aquifer protection area is located partially or entirely within the Town of Willington.

(2) Notice of such delineation shall be published in a newspaper having substantial circulation in the affected area. Such notice shall include at least the following:

(A) a map or detailed description of the subject aquifer protection area; and

(B) the name, telephone number, and address of a representative of the Agency who may be reached for further information.

(b) In order to clarify the location of an aquifer protection area boundary, the Agency may apply to the Commissioner to extend such boundary to coincide with the nearest property line, municipal boundary or topographic feature pursuant to §22a-354i-4 of the Regulations of Connecticut State Agencies. Such extension shall, at a minimum, fully encompass the aquifer protection areas bounded by the approved level A mapping but shall not exceed the distance necessary to clarify the location of the aquifer protection area or to facilitate the administration of regulations pertaining thereto. An aquifer protection area boundary may not be extended without prior written approval of the Commissioner.

(1) Any request by the Agency to the Commissioner for extension of an aquifer protection area boundary shall include at least the following:

(A) A map to scale delineating (i) the aquifer protection area boundary mapped under Section 3(a) of these Regulations and (ii) the proposed extension of the aquifer protection area boundary;

(B) A certification by the chairperson or duly authorized agent of the Agency that notice of such request has been provided to all owners of property within the proposed extended aquifer protection area and all affected water companies in accordance with the following:

(i) Such notice shall include at least the following:

(aa) A map showing the aquifer protection area boundaries and the proposed extension of such boundaries,

(bb) the name, address, and telephone number of a representative of the Agency who may be contacted for further information, and

(cc) a statement that any person may, not later than thirty (30) days after said notification, submit to the Agency written comments on such proposed boundary extension;

(ii) Such notice shall be effectuated by the following:

(aa) Delivery of notice by certified mail to those individuals and entities identified in Subsection (b)(1)(B) of this Section, or

(bb) the publication of a notice in a newspaper having substantial circulation in the affected area; and posting of notice near the proposed boundaries of the subject aquifer protection area of at least four signs each of which shall be at least four square feet in size (2′ x 2′); and

(iii) a summary of comments received by such Agency regarding the proposed boundary extension and the Agency's response.

(2) Not later than sixty (60) days after receiving the Commissioner's written approval of a request to extend an aquifer protection area boundary, the Agency shall cause such boundary to be delineated in accordance with Subsection (a) of this Section.

(c) No person may challenge the boundaries of the aquifer protection area under these Regulations unless such challenge is based solely on a failure by the Agency to properly delineate the boundaries in accordance with §22a-354n of the Connecticut General Statutes.

(d) A map of the location and boundaries of the aquifer protection areas, or regulated areas, shall be available for inspection in the Office of the City/Town Clerk or the Agency.

(e) If the Level A mapping is amended in accordance with §22a-354b-1(i) or §22a-354b-1(j) of the Regulations of Connecticut State Agencies, the Agency shall cause the amended aquifer protection area boundary to be delineated in accordance with Subsections (a) or (b) of this Section.

SECTION 4. Prohibited and Regulated Activities

(a) All regulated activities are prohibited in aquifer protection areas, except as specified in Subsection (b) of this Section 4.

(b) The following regulated activities are not prohibited in aquifer protection areas:

(1) A registered regulated activity which is conducted in compliance with §22a-354i-9 of the Regulations of Connecticut State Agencies or Section 12 of these Regulations; and

(2) a regulated activity which has received a permit issued pursuant to §22a-354i-8 of the Regulations of Connecticut State Agencies or Section 9 of these Regulations.

(c) The following are not regulated activities:

(1) Any activity conducted at a residence without compensation;

(2) any activity involving the use or storage of no more than two and one-half (2.5) gallons of each type of hazardous material on-site at any one time, provided the total of all hazardous materials on-site does not exceed fifty-five (55) gallons at any one time;

(3) any agricultural activity regulated pursuant to §22a-354m(d) of the Connecticut General Statutes;

(4) any activity provided all the following conditions are satisfied:

(A) such activity takes place solely within an enclosed building in an area with an impermeable floor,

(B) such activity involves no more than 10% of the floor area in the building where the activity takes place,

(C) any hazardous material used in connection with such activity is stored in such building at all times,

(D) all waste waters generated by such activity are lawfully disposed through a connection to a publicly owned treatment works, and

(E) such activity does not involve (i) repair or maintenance of internal combustion engines, including without limitation, vehicles, or equipment associated with such vehicles, (ii) underground storage of any hazardous material, or (iii) above ground storage of more than one hundred and ten (110) gallons of hazardous materials;

(5) any activity solely involving the use of lubricating oil provided all the following conditions are satisfied:

(A) such activity does not involve cleaning of metals with chlorinated solvents at the facility,

(B) such activity takes place solely within an enclosed building in an area with an impermeable floor,

(C) any hazardous material used in connection with such activity is stored in such building at all times, and

(D) such activity does not involve: (i) repair or maintenance of internal combustion engines, including without limitation, vehicles, or equipment associated with such vehicles, (ii) underground storage of any hazardous material, or (iii) above ground storage of more than one hundred ten (110) gallons of such lubricating oil and associated hazardous waste; and

(6) any activity involving the dispensing of oil or petroleum from an above-ground storage tank or tanks with an aggregate volume of two thousand (2000) gallons or less provided all the following conditions are satisfied:

(A) such dispensing activity takes place solely on a paved surface which is covered by a roof,

(B) the above-ground storage tank(s) is a double-walled tank with overfill alarms, and

(C) all associated piping is either above ground, or has secondary containment.

(d) Determination of a non-regulated activity

(1) Any person proposing to carry out a non-regulated activity, as set forth in Section 4(c) of these regulations, in an aquifer protection area shall, prior to commencement of such activity, notify the Agency or its duly authorized agent on a form provided by the Agency. Such form shall provide sufficient information to enable the Agency or its duly authorized agent to properly determine that the proposed activity is a regulated activity or a non-regulated activity within the aquifer protection area.

(2) If such activity is determined to be a non-regulated activity, then no further action under these Regulations is necessary.

SECTION 5. Activities Regulated by the State

(a) The Commissioner shall exclusively regulate activities within aquifer protection areas that are specified in §22a-354p(g) of the Connecticut General Statutes. The Agency shall regulate all other regulated activities.

Presently, §22a-354p(g) grants the Commissioner exclusive authority to regulate activities proposed by:

(1) any person to whom the Commissioner has issued an individual permit under the national pollutant discharge elimination system of the federal Clean Water Act (33 USC 1251, *et seq.*), or
(2) under the state pollutant discharge elimination system pursuant to Conn. Gen. Stats. § 22a-430, or
(3) any person to whom the Commissioner has issued a permit under the provisions of the federal Resource Conservation and Recovery Act (42 USC 6901, *et seq.*) for a treatment, storage or disposal facility;
(4) any public service company, as defined in Conn. Gen. Stats. § 16-1, providing gas, electric, pipeline, water or telephone service;
(5) any large quantity generator, as defined in regulations adopted by the Commissioner under Conn. Gen. Stats. § 22a-339; or
(6) any state department, agency or instrumentality, except any local or regional board of education.

(b) Any person conducting regulated activities that are within the authority of the Commissioner shall submit a registration or obtain a permit or exemption from the Commissioner prior to engaging in such activity. The Commissioner shall process applications for those regulated activities.

(c) The Agency may submit an advisory decision to the Commissioner for consideration on any permit regulated under this Section in accordance with the Connecticut General Statutes §22a-354p(g).

SECTION 6. Application for an Exemption from Prohibition or Regulation

(a) The owner or operator of a regulated activity may seek an exemption from the Commissioner pursuant to §22a-354i-6 of the Regulations of Connecticut State Agencies.

(b) The Agency may submit written comments to the Commissioner on any exemption regulated under this Section in accordance with §22a-354i-6(c) of the Regulations of Connecticut State Agencies within sixty (60) days of the agency receipt of copy of the application.

SECTION 7. General Registration, Permit Application and Transfer Procedures

(a) All applications for permits and registrations shall contain sufficient information for a fair and informed determination of the issues. The Agency may request additional information from the applicant for this purpose.

(b) The day of receipt of a registration, permit application or transfer form shall be the day of the next regularly scheduled meeting of the Agency, immediately following the day of submission of the application to the Agency or its duly authorized agent, or thirty-five (35) days after such submission, whichever is sooner.

(c) At any time during the review period, the Agency may require the applicant or registrant to provide additional information about the regulated activity. Requests for additional information shall not stay the time limitations for registrations and permits as set forth in Sections 8 and 9 of these Regulations.

(d) All permit applications and registrations shall be open for public inspection.

(e) Incomplete permit applications and registrations may be denied without prejudice.

(f) No permit or registration issued under Sections 8 or 9 of these Regulations shall be assigned or transferred except with written approval by the Agency.

(g) The Agency shall notify the town clerk of any adjoining municipality of the pendency of any application, petition, appeal, request or plan concerning any project on any site in which: (1) any portion of the property affected by a decision of such agency is within five-hundred feet of the boundary of the adjoining municipality; (2) a significant portion of the traffic to the completed project on the site will use streets within the adjoining municipality to enter or exit the site; (3) a significant portion of the sewer or water drainage from the project on the site will flow through and significantly impact the drainage or sewerage system within the adjoining municipality; or (4) water runoff from the improved site will impact streets or other municipal or private property within the adjoining municipality. Such notice shall be made by certified mail, return receipt requested, and shall be mailed within seven days of the date of receipt of the application, petition, request or plan. Such adjoining municipality may, through a representative, appear and be heard at any hearing on any such application, petition, appeal, request or plan.

SECTION 8. Registration Requirements

(a) Any person engaged in a regulated activity which substantially commenced, or was in active operation within the past five (5) years, or with respect to which a municipal building permit was issued, either (A) before the effective date of the state aquifer protection regulations, or (B) before the date an applicable aquifer protection area is designated on a municipal zoning district map or inland wetland and watercourse areas map, whichever occurs later, shall register the activity in accordance with this Section unless such person has pending an application for an exemption pursuant to §22a-354i-6 of the Regulations of Connecticut State Agencies.

(1) The Commissioner shall process registrations for those regulated activities specified in §22a-354p(g) of the Connecticut General Statutes. The Agency shall process registrations for all other regulated activities.

(2) If the regulated activity is not specified in §22a-354p(g) of the Connecticut General Statutes, the person engaged in such activity shall submit a registration to the Agency not later than one hundred eighty (180) days after adoption of regulations pursuant to §22a-354p of the Connecticut General Statutes, or the designation the aquifer protection area pursuant to §22a-354i-2 of the Regulations of Connecticut State Agencies, whichever occurs later. Said person shall simultaneously file a copy of the registration with the Commissioner, Commissioner of Public Health and the affected water company.

(b) All registrations shall be provided on a form prescribed by the Agency and shall be accompanied by the correct registration fee in accordance with Section 18 of these Regulations. Such registration forms may be obtained from the Willington /Town Clerk or the Agency. Such registration forms shall include at least the following information in writing or on maps or drawings:

(1) The name, business telephone number, street address and mailing address of the:

(A) Registrant; if the registrant is a corporation or limited partnership, the full name of the facility and such corporation or limited partnership as registered with the Connecticut Secretary of State, and any officer or governing or managing body of any partnership, association, firm or corporation,

(B) owner of such facility if different than the registrant, and

(C) manager or operator overseeing the operations of such facility;

(2) the location of such facility, using street address or other appropriate method of location, and a map showing the property boundaries of the facility on a 1:24,000 scale United States Geological Survey topographic quadrangle base;

(3) an identification of the regulated activity or activities conducted at the facility, as described in Section 2(a)(35) of the APA Regulations, which regulated activity or

(4) a certification by the registrant that the subject regulated activity is in compliance with the best management practices set forth in Section 12(a) of the APA Regulations, as follows, signed after satisfying the statements set forth in the following certification:

> "I have personally examined and am familiar with the information submitted in this registration and all attachments, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in this document or certification may be punishable as a criminal offense under §53a-157b of the Connecticut General Statutes and any other applicable law."

(c) When deemed necessary to protect a public supply well subject to regulation under §22a-354c or §22a-354z of the Connecticut General Statutes, the Agency may:

(1) require, by written notice, any registrant to submit for review and written approval a storm water management plan prepared in accordance with Section 12(b) of the APA Regulations. If so required, the storm water management plan shall be implemented by the registrant immediately upon its approval; or

(2) require, by written notice, any registrant to submit for review and written approval the materials management plan prepared in accordance with Section 12(a) of the APA Regulations. If so required, the materials management plan shall be implemented by the registrant immediately upon its approval.

(d) If the Agency determines that a registration is incomplete, it shall reject the registration and notify the registrant of what additional information is required and the date by which it shall be submitted.

(e) If the registration is determined to be complete, and the regulated activity is eligible for registration, the Agency shall send written notification of such registration to the registrant. Such registration shall be determined to be complete and eligible if the registrant has not otherwise received a notice of rejection from the Agency, not later than one hundred and eighty (180) days after the date the registration is received by the Agency.

(f) The following general provisions shall be included in the issuance of all registrations:

(1) The Agency has relied in whole or in part on information provided by the registrant and if such information subsequently proves to be false, deceptive, incomplete or inaccurate, the registration may be modified, suspended or revoked;

(2) all registrations issued by the Agency are subject to and do not derogate any present or future rights or powers of the Commissioner, Agency, or municipality, and convey

no rights in real estate or material nor any exclusive privileges, and are further subject to any and all public and private rights and to any federal, state, and municipal laws or regulations pertinent to the subject land or activity;

(3) a complete registration shall expire five (5) years from the date of receipt of such registration by the Agency;

(4) the registrant shall apply to the Agency to renew the registration on a form prescribed by the Agency for a facility prior to expiration of such registration; and

(5) If a registered regulated activity is out of business or inactive when registration renewal is required, a five (5) year allowance shall be in effect from the date the registration expires. If the registrant has not applied to renew the registration within five (5) years of the date the registration expires, the facility is no longer eligible for registration.

(g) If a regulated activity which is eligible for registration in accordance with Subsection (a) of this Section fails to be registered or if the registrant of an active registered activity fails to apply for renewal prior to expiration, the Commissioner or municipal aquifer protection agency, as appropriate, may accept a late registration at their discretion, subject to the limitations in Subsection (f)(5) of this Section.

(h) Any person wishing to assume the benefits under a registration for regulated activities shall apply to transfer such registration on a form prescribed by the Agency and submitted to the Agency.

SECTION 9. Permit Requirements

(a) Any person may apply for a permit to add a regulated activity to a facility where a registered regulated activity occurs.

(b) The Agency shall process permit applications for those registrants that have registered pursuant to Section 8 of these Regulations. The Commissioner shall process permit applications for regulated activities specified in §22a-354p(g) of the Connecticut General Statutes and for those registrants that have registered pursuant to §22a-354i-7(b)(1) of the Regulations of Connecticut State Agencies.

(c) Action shall be taken on permit applications within sixty-five (65) days after the completion of a public hearing or in the absence of a public hearing within sixty-five (65) days from the date of receipt of the application. The applicant may consent to one or more extensions of either of these timeframes, provided the total extension of all such periods is sixty-five (65) days or less.

(d) An application for a permit shall be made on a form prescribed by the Agency and shall be accompanied by the correct application fee in accordance with Section 18 of these Regulations. Such permit application forms may be obtained from the Willington Town Clerk or the Agency. Simultaneously with filing an application, the applicant shall send a copy of the application to the Commissioner, the Commissioner of Public Health and the affected water company. An application shall include the following information:

(1) The information as required for a registration under Section 8(b) of these Regulations shall be provided for the proposed regulated activity;

(2) a confirmation and certification that the existing and proposed activity:

  (A) remains and shall remain in compliance with Section 12(a) of these Regulations,

  (B) shall not increase the number of underground storage tanks used for storage of hazardous materials, and

  (C) remains and shall remain in compliance with all local, state, and federal environmental laws;

(3) a materials management plan in accordance with Section 12(a) of these Regulations;

(4) a storm water management plan in accordance with Section 12(b) of these Regulations;

(5) the following environmental compliance information with respect to environmental violations which occurred at the facility where the regulated activities are conducted, within the five years immediately preceding the date of the application:

  (A) any criminal conviction involving a violation of any environmental protection law,

  (B) any civil penalty imposed in any state or federal judicial proceeding, or any penalty exceeding five thousand dollars imposed in any administrative proceeding, and

  (C) any judicial or administrative orders issued regarding any such violation together with the dates, case or docket numbers, or other information which identifies the proceeding. For any such proceeding initiated by the state or federal government, the Agency may require submission of a copy of any official document associated with the proceeding, the final judgment or order;

(6) any additional information deemed necessary by the Agency regarding potential threats to the ground water and proposed safeguards; and

(7) the following certification signed by the applicant and the individual responsible for preparing the application, after satisfying the statements set forth in the certification:

> "I have personally examined and am familiar with the information submitted in this document and all attachments, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining

the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information is punishable as a criminal offense under §53a-157b of the Connecticut General Statutes and any other applicable law."

(e) The Commissioner, any affected water company or the Commissioner of Public Health may, not later than thirty (30) days after receiving a copy of an application for a permit under this Section, submit to the Agency written comments on such application. The Agency shall give due consideration to any such comments, and shall provide a copy of the decision to the Commissioner, the affected water company and the Commissioner of Public Health.

(f) To carry out the purposes of the Act, the Agency may grant an application as filed, grant it upon such terms, conditions, limitations or modifications necessary, or deny it. The Agency shall state upon the record the reason for its decision.

(g) The Agency may hold a public hearing on an application for a permit in accordance with Section 10 of these Regulations.

(h) The Agency shall not issue a permit unless a complete application has been received and the applicant demonstrates to the Agency's satisfaction that all requirements of this Section of the Regulations have been satisfied and all of the following standards and criteria have been met:

(1) the proposed regulated activity shall take place at a facility where a registered regulated activity occurs;

(2) the proposed regulated activity shall not increase the number, or storage capacity of underground storage tanks used for hazardous materials except for the replacement of an existing underground storage tank in accordance with Section 12(a)(3) of these Regulations;

(3) the materials management plan and storm water management plan have been satisfactorily prepared in accordance with Sections 12(a) and 12(b) of these Regulations;

(4) the applicant has submitted a confirmation and certification that all regulated activities remain and shall remain in compliance with all local, state and federal environmental laws in accordance with Subsection (d)(2) of this Section;

(5) the applicant's compliance record does not indicate (A) that any noncompliance resulted from indifference to or disregard for the legal requirements, (B) an unwillingness or inability to devote the resources necessary to comply and remain in compliance, or (C) that instances of noncompliance have led to serious environmental harm, harm to human health or safety, or a substantial risk of such harm;

(6) the proposed regulated activity shall be conducted in accordance with Section 12 of these Regulations;

(7) the existing regulated activity is being conducted in accordance with Section 12 of these Regulations; and

(8) the certification required under Subsection (d)(7) of this Section has been signed by the applicant and the individual responsible for preparing the application.

(i) The Agency may impose reasonable conditions or limitations on any permit issued under this Section to assure protection of the ground water, including, but not limited to the following:

(1) best management practices in addition to those set forth in Section 12 of these Regulations; and

(2) ground water monitoring.

(j) The following general provisions shall be included in the issuance of all permits:

(1) the Agency has relied in whole or in part on information provided by the applicant and if such information subsequently proves to be false, deceptive, incomplete or inaccurate, the permit may be modified, suspended or revoked;

(2) all permits issued by the Agency are subject to and do not derogate any present or future rights or powers of the Commissioner, Agency, or municipality, and convey no rights in real estate or material nor any exclusive privileges, and are further subject to any and all public and private rights and to any federal, state, and municipal laws or regulations pertinent to the subject land or activity;

(3) the permit shall expire ten (10) years from the date of issuance of such permit by the Agency; and

(4) a person shall apply to the Agency to renew the permit on a form prescribed by the Agency prior to expiration of such permit. Such renewal shall be granted upon request by the Agency unless a substantial change in the permitted activity is proposed, or enforcement action with regard to the regulated activity has been taken, in which case, a new permit application shall be submitted and reviewed in accordance with the provisions of this Section.

(k) The Agency shall notify the applicant or permittee within fifteen (15) days of the date of the decision by certified mail, return receipt requested, and the Agency shall cause notice of its order in issuance or denial of a permit to be published in a newspaper having a general circulation in the municipality in which the aquifer protection area is located.

(l) A permittee may request a modification of a permit from the Agency. Such request shall be on a form prescribed by the Agency, and shall include the facts and reasons supporting the request. The Agency may require the permittee to submit a new application for a permit or renewal in lieu of a modification request.

(m) A person wishing to assume the benefits under a permit for regulated activities shall apply to transfer such permit on a form prescribed by the Agency and submitted to the Agency.

SECTION 10. Public Hearings Regarding Permit Applications

(a) If the Agency decides to hold a public hearing regarding an application for a permit to conduct a regulated activity within an aquifer protection area, such hearing shall commence no later than sixty-five (65) days after the receipt of such application.

(b) Notice of the hearing shall be published at least twice at intervals of not less than two (2) days, the first not more than fifteen (15) days and not fewer than ten (10) days, and the last not less than two (2) days before the date set for the hearing in a newspaper having a general circulation in each city/town where the affected aquifer, or any part thereof, is located.

(c) The Agency shall send to any affected water company, at least ten (10) days before the hearing, a copy of the notice by certified mail, return receipt requested. Any affected water company may, through a representative, appear and be heard at any such hearing.

(d) All applications, maps and documents relating thereto shall be open for public inspection.

(e) At such hearing any person or persons may appear and be heard.

(f) The hearing shall be completed within thirty-five (35) days of its commencement.

(g) The applicant may consent to an extension of the time frames in Subsections (a) or (f) of this Section, provided the total extension of all such periods, including any extensions provided in Section 9(c), totals sixty-five (65) days or less.

(h) In reaching its decision on any application after a public hearing, the Agency shall base its decision on the record of that hearing. Documentary evidence or other material not in the hearing record shall not be considered by the Agency in its decision.

(i) The applicant or permittee shall be notified of the Agency's decision in accordance with Section 9(k) of these Regulations.

SECTION 11. Bond and Insurance Relevant to Permit Applicants

(a) An applicant may be required to file a bond as a condition of the permit.

(b) Any bond or surety shall be conditioned on compliance with all provisions of these regulations and the terms, conditions and limitations established in the permit.

SECTION 12. Best Management Practices

(a) Every regulated activity shall be conducted in accordance with the following:

(1) hazardous materials may be stored above ground within an aquifer protection area

(A) hazardous material shall be stored in a building or under a roof that minimizes storm water entry to the hazardous material storage area, except that a roof is not required for a bulk storage facility as defined in Section 2 of these Regulations,

(B) floors within a building or under a roof where hazardous material may be stored shall be constructed or treated to protect the surface of the floor from deterioration due to spillage of any such material,

(C) a structure which may be used for storage or transfer of hazardous material shall be protected from storm water run-on, and ground water intrusion,

(D) hazardous material shall be stored within an impermeable containment area which is capable of containing at least the volume of the largest container of such hazardous material present in such area, or 10% of the total volume of all such containers in such area, whichever is larger, without overflow of released hazardous material from the containment area,

(E) hazardous material shall not be stored with other hazardous materials that are incompatible and may create a hazard of fire, explosion or generation of toxic substances,

(F) hazardous material shall be stored only in a container that has been certified to meet state or federal specifications for containers suitable for the transport or storage of such material,

(G) hazardous material shall be stored only in an area that is secured against un-authorized entry by the public, and

(H) the requirements of this subdivision are intended to supplement, and not to supersede, any other applicable requirements of federal, state, or local law, including applicable requirements of the Resource Conservation and Recovery Act of 1976;

(2) no person shall increase the number of underground storage tanks used to store hazardous materials;

(3) an underground storage tank used to store hazardous materials shall not be replaced with a larger tank unless (A) there is no more than a 25% increase in volume of the larger replacement tank, and (B) the larger replacement tank is a double-walled tank with co-axial piping, both meeting new installation component standards pursuant to §22a-449(d)-1(e) and §22a-449(d)-102 of the Regulations of Connecticut State Agencies, and with interstitial monitoring;

(4) no person shall use, maintain or install floor drains, dry wells or other infiltration devices or appurtenances which allow the release of waste waters to the ground,

unless such release is permitted by the Commissioner in accordance with §22a-430 or §22a-430b of the Connecticut General Statutes; and

(5) a materials management plan shall be developed and implemented in accordance with the following:

(A) a materials management plan shall contain, at a minimum, the following information with respect to the subject regulated activity:

(i) a pollution prevention assessment consisting of a detailed evaluation of alternatives to the use of hazardous materials or processes and practices that would reduce or eliminate the use of hazardous materials, and implementation of such alternatives where possible and feasible,

(ii) a description of any operations or practices which may pose a threat of pollution to the aquifer, which shall include the following:

(aa) a process flow diagram identifying where hazardous materials are stored, disposed and used, and where hazardous wastes are generated and subsequently stored and disposed,

(bb) an inventory of all hazardous materials which are likely to be or will be manufactured, produced, stored, utilized or otherwise handled, and

(cc) a description of waste, including waste waters generated, and a description of how such wastes are handled, stored and disposed,

(iii) the name, street address, mailing address, title and telephone number of the individual(s) responsible for implementing the materials management plan and the individual(s) who should be contacted in an emergency,

(iv) a record-keeping system to account for the types, quantities, and disposition of hazardous materials which are manufactured, produced, utilized, stored, or otherwise handled or which are discharged or emitted; such record-keeping system shall be maintained at the subject facility and shall be made available thereat for inspection during normal business hours by the Commissioner and the municipal aquifer protection agency, and

(v) an emergency response plan for responding to a release of hazardous materials. Such plan shall describe how each such release could result in pollution to the underlying aquifer and shall set forth the methods used or to be used to prevent and abate any such a release;

(B) when a materials management plan is required under either Section 8(c) or 9(d) of the APA Regulations, such materials management plan shall be completed and certified by a professional engineer or a certified hazardous materials manager, or, if the facility where the regulated activity is conducted has received and maintained an ISO 14001 environmental management system certification, then the registrant may complete and certify the materials management plan; and

(C) the materials management plan shall be maintained at the subject facility and shall be made available thereat for inspection during normal business hours by the Commissioner and the municipal aquifer protection agency.

(b) The development and implementation of a storm water management plan required for regulated activities in accordance with Sections 8(c) and 9(d) of these Regulations, shall be as follows: A storm water management plan shall assure that storm water run-off generated by the subject regulated activity is (i) managed in a manner so as to prevent pollution of ground water, and (ii) shall comply with all of the requirements for the General Permit of the Discharge of Storm Water associated with a Commercial Activity issued pursuant to §22a-430b of the Connecticut General Statutes.

SECTION 13. Other State, Federal and Local Laws

(a) Nothing in these regulations shall obviate the requirement for the applicant to obtain any other assents, permits or licenses required by law or regulation by the Town of Willington, State of Connecticut and the Government of the United States including any approval required by the Connecticut Department of Environmental Protection and the U.S. Army Corps of Engineers and the United States Environmental Protection Agency. Obtaining such assents, permits or licenses are the sole responsibility of the applicant.

(b) No person shall conduct any regulated activity within an aquifer protection area which requires zoning or subdivision approval without first having obtained a valid certificate of zoning or subdivision approval, special permit, special exception or variance, or other documentation establishing that the proposal complies with the Town of Willington zoning or subdivision regulations.

SECTION 14. Enforcement

(a) The Agency may appoint a duly authorized agent to act in its behalf with the authority to issue notices of violation or cease and desist orders.

(b) If the Agency or its duly authorized agent finds that any person is conducting or maintaining any activity, facility or condition which violates any provision of these regulations, the Agency or its duly authorized agent may:

(1) Issue a notice of violation.

(A) The notice of violation shall state the nature of the violation, the jurisdiction of the Agency, and the necessary action required to correct the violation including without limitation halting the activity in the aquifer protection area.

(B) The Agency may request that the person appear at the next regularly scheduled meeting of the Agency to discuss the unauthorized activity, and/or provide a written reply to the notice or file an application for the necessary permit or registration. Failure to carry out the action(s) directed in a notice of violation may result in issuance of an order under Subsection (2) of this Section or other enforcement proceedings as provided by law.

(2) Issue a written order.

(A) Such order shall be issued by certified mail, return receipt requested to such person conducting such activity or maintaining such facility or condition to cease such activity immediately or to correct such facility or condition. The Agency shall send a copy of such order to any affected water company by certified mail, return receipt requested.

(B) Within ten (10) days of the issuance of such order the Agency shall hold a hearing to provide the person an opportunity to be heard and show cause why the order should not remain in effect. Any affected water company may testify at the hearing. The Agency shall consider the facts presented at the hearing and, within ten (10) days of the completion of the hearing, notify the person by certified mail, return receipt requested, that the original order remains in effect, that a revised order is in effect, or that the order has been withdrawn.

(3) Suspend or revoke registration or permit.

(A) The Agency may suspend or revoke a registration or a permit if it finds, after a hearing, that the registrant or permittee has not complied with the terms, conditions or limitations set forth in the registration or the permit. Prior to revoking or suspending any registration or permit, the Agency shall issue notice to the registrant or the permittee, personally or by certified mail, return receipt requested, setting forth the facts or conduct that warrants the intended action.

(B) The Agency shall hold a hearing to provide the registrant or permittee an opportunity to show that it is in compliance with its registration or permit. The Agency shall notify the registrant or permittee of its decision by certified mail within fifteen (15) days of the date of its decision. The Agency shall publish notice of a suspension or revocation in a newspaper having general circulation in the /Town of Willington.

(c) An order issued pursuant to Subsection (b)(2) of this Section shall be effective upon issuance, shall remain in effect until the Agency affirms, revises, or withdraws the order, and shall not delay or bar an action pursuant to Subsection (b)(3) of this Section.

(d) A court may assess criminal and or civil penalties to any person who commits, takes part in, or assists in any violation of any provision of the APA regulations in accordance with §22a-354s(b) and §22a-354s(c) of the Connecticut General Statutes.

SECTION 15. Amendments

(a) These regulations may be amended, changed or repealed in accordance with §22a-354p(b) of the Connecticut General Statutes.

(b) If a complete application is filed with the Agency which is in conformance with **these Regulations** as of the date of its filing, the permit issued shall not be required to comply with any changes in regulations taking effect on or after the filing date. The provisions of this Section shall not apply to the establishment, amendment, or change of the boundaries of the aquifer protection area or to any changes in these Regulations necessary to make the regulations consistent with Chapter 446i of the Connecticut General Statutes as of the date of the Agency's decision.

SECTION 16. Appeals

(a) Appeal of the Agency's regulation, order, decision or action shall be made in accordance with §22a-354q of the Connecticut General Statutes.

SECTION 17. Conflict and Severance

(a) If there is a conflict between the provisions of these Regulations, the provision that imposes the most stringent standards shall govern. The invalidity of any word, clause, sentence, section, part, subsection, subdivision or provision of these regulations shall not affect the validity of any other part that can be given effect without such valid part or parts.

(b) If there is a conflict between the provisions of these Regulations and the Act, the provisions of the Act shall govern.

SECTION 18. Registration and Permit Application Fees

(a) All fees required by these regulations shall be submitted to the Agency by certified check or money order payable to the Town of Willington at the time the registration or permit application is filed with the Agency.

(b) No registration or permit application shall be granted or approved by the Agency unless the correct registration/application fee is paid in full or unless a waiver has been granted by the Agency pursuant to Subsection (f) of this Section.

(c) The registration or permit application fee is nonrefundable.

(d) Registration or permit application fees shall be based on the following schedule:

SECTION 19. Fee Schedule

Fee Schedule			
	Facility Size		
	Small (< 1 acre)	Medium (1-5 acres)	Large (> 5 acres)
Registrations:			
Industrial	$250	$400	$600
Commercial	$250	$400	$600
Other	$250	$400	$600
Permits:			
Industrial	$500	$750	$1,000
Commercial	$500	$750	$1,000
Other	$500	$750	$1,000
Materials Management Plan Reviews	$150	$150	$150
Storm water Management Plan Reviews	$150	$150	$150
Public Hearing	$200	$200	$200
Facility Inspection/Monitoring	$150	$150	$150
Regulation Petition	$250	$250	$250

(a) Boards, commissions, councils and departments of the Town of Willington are exempt from all fee requirements.

(b) The registrant or applicant may petition the Agency to waive, reduce or allow delayed payment of the fee. Such petitions shall be in writing and shall state fully the facts and circumstances the Agency should consider in its determination under this Section. The Agency may waive all or part of the application fee if the Agency determines that:

(1) the activity applied for would clearly result in a substantial public benefit to the environment or to the public health and safety and the registrant or applicant would reasonably be deterred from initiating the activity solely or primarily as a result of the amount of the registration or permit application fee; or

(2) the amount of the registration or permit application fee is clearly excessive in relation to the cost to the City/Town for reviewing and processing the application.

(c) Extra Assessments

In the event that additional expenses, including but not limited to outside consultants, experts, or legal advisors are incurred in processing the registration or permit application the applicant/registrant may be assessed an additional fee not to exceed the cost to the Town, to cover said costs. Said fees are to be estimated by the duly authorized agent and submitted with the application fee and held until the application is completely processed after which time any residual funds pertaining to this assessment are to be returned to the applicant/registrant.

For the purpose of this assessment, an "outside consultant" means a professional who is not an employee of the Town of Willington including but not limited to engineering, environmental, hydrogeology and hazardous materials management professionals.

(d) The Agency shall state upon its record the basis for all actions under this Section.

SECTION 20. Effective Date of Regulations

The APA Regulations, APA boundaries and amendments thereto, shall become effective upon (1) the Commissioner's determination that such regulations are reasonably related to the purpose of ground water protection and not inconsistent with the Regulations of Connecticut State Agencies §22a-354i-1 through §22a-354i-10 and (2) filing in the Office of the Town Clerk.

Effective Date: 7-1-09

Revision Date: _____________

APPENDIX F

Groundwater Under the Direct Influence Correspondence

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH AND ADDICTION SERVICES

July 28, 1995

Mr. Stefan Wawzyniecki, Jr.
Chemical Health & Safety Mgr.
University of Connecticut
Environmental Health and Safety
189 Auditorium Road
Room 219, U-97
Storrs, CT 06269-3097

RE: Willimantic River Wellfield-Evaluation of Groundwater Under the Direct Influence of Surface Water Demonstration Study

Dear Mr. Wawzyniecki:

I have evaluated all the detailed data submitted by the University of Connecticut to determine whether the Willimantic River wells are under the direct influence of surface water. The evaluation included a review of historical water quality data, the Step 2 Sampling Program including quarterly microscopic particulate analysis (MPA) from Willimantic Rivers Wells #1 and #2; weekly physical analyses from Willimantic River Wells #1 and #2 and the Willimantic River; construction records and physical features of Wells #1 and #2; Level B aquifer mapping data, and a site survey of the Willimantic River wellfield.

The historical water quality data provided by the University of Connecticut is satisfactory. The weekly physical analyses (pH, color, temperature, turbidity) of the wells and the Willimantic River differ in composition and do not indicate a direct influence exists between the entities.

The quarterly microscopic particulate analysis (MPA) of samples from the wells were typically characteristic of groundwater according to submitted reports by Northeast Laboratories, Inc. and Analytical Services, Inc. The MPA analyses were evaluated under the criteria set forth by the EPA document "Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA)." All quarterly samples from both wells had no detection of any particulate matter associated with surface water. No Giardia, Cryptosporidium, or any other high risk organisms were detected in any of the samples.

Phone: 240-9262
Telephone Device for the Deaf (203) 566-1279
150 Washington Street — Hartford, CT 06106
An Equal Opportunity Employer

The aquifer in which the Willimantic River wellfield is located is well documented as a stratified drift aquifer consisting of sand, gravel, and some clays. Well construction logs for production and test wells and data obtained from the Level B aquifer mapping project were all reviewed to evaluate well construction and geologic features of the aquifer. These records all indicate proper well construction and good natural filtration materials present in the geologic features of the aquifer.

The data presented by the Environmental Health and Safety Office of the University of Connecticut does not show evidence that the groundwater from Willimantic River Wells #1 and #2 is under the direct influence of surface water. Therefore, filtration is not required for the Willimantic River wellfield at this time. This assessment does not preclude a future determination of potential direct surface water influence should any of the previously mentioned factors change or additional factors become relevant. This section will continue to review your routine compliance reports for any such indications and notify you if any possible concerns ever arise.

Thank you for your completion of this arduous groundwater determination study at the University of Connecticut.

Sincerely,

Steve Messer

Steve Messer
Sanitary Engineer III
Water Supplies Section

SM/ml
cc: Earl Eldredge, Facilities Mgmt.
U. of CT

Williman.ml

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH AND ADDICTION SERVICES

July 27, 1995

Mr. Stefan Wawzyniecki, Jr.
Chemical Health & Safety Mgr.
University of Connecticut
Environmental Health and Safety
189 Auditorium Road
Room 219, U-97
Storrs, CT 06269-3097

RE: Fenton River Wellfield-Evaluation of Groundwater Under the Direct Influence of Surface Water Demonstration Study

Dear Mr. Wawzyniecki:

I have evaluated all the detailed data submitted by the University of Connecticut to determine whether the Fenton River wells are under the direct influence of surface water. The evaluation included a review of historical water quality data, the Step 2 Sampling Program including quarterly microscopic particulate analysis (MPA) from Fenton River Wells A, B, and C; weekly physical analyses from Fenton River Wells A, B, and C and the Fenton River; construction records and physical features of Wells A, B, and C; Level B aquifer mapping data, and a site survey of the Fenton River wellfield.

The historical water quality data provided by the University of Connecticut is satisfactory. The weekly physical analyses (pH, color, temperature, turbidity) of the wells and the Fenton River differ in composition and do not indicate a direct influence exists between the entities.

The quarterly microscopic particulate analysis (MPA) of samples from the wells were typically characteristic of groundwater according to submitted reports by Northeast Laboratories, Inc. and Analytical Services, Inc. The MPA analyses were evaluated under the criteria set forth by the EPA document "Consensus Method for Determining groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA)". While some particulate matter (algae, diatoms) was detected in the first quarterly sample at Well C, this sample is considered an anomaly which could have resulted from either sample collection and/or laboratory error. An additional quarterly sample was required during the same seasonal time of year at this source and no evidence of any surface water indicators was detected. All other quarterly MPA samples at all three Fenton River wells had no particulate matter associated with surface water detected. No Giardia, Cryptosporidium, or any other high risk organisms were detected in any of the samples.

Phone:
Telephone Device for the Deaf (203) 566-1279
150 Washington Street — Hartford, CT 06106
An Equal Opportunity Employer

The aquifer in which the Fenton River wellfield is located is well documented as a stratified drift aquifer consisting of sand, gravel, and some clays. Well construction logs for production and test wells and data obtained from the Level B aquifer mapping project were all reviewed to evaluate well construction and geologic features of the aquifer. These records all indicate proper well construction and good natural filtration materials provided by the geologic features of the aquifer.

The data presented by the Environmental Health and Safety Office of the University of Connecticut does not show evidence that the groundwater from Fenton River Wells A, B, and C is under the direct influence of surface water. Therefore, filtration is not required for the Fenton River wellfield at this time. This assessment does not preclude a future determination of potential direct surface water influence, should any of the previously mentioned factors change or additional factors become relevant. This section will continue to review your routine compliance reports for any such indications and notify you if any possible concerns ever arise.

Thank you for your completion of this arduous groundwater determination study at the University of Connecticut.

Sincerely,

Steve Messer
Sanitary Engineer III
Water Supplies Section

SM/ml
cc: Earl Eldredge, Facilities Mgmt.
University of CT
189 Auditorium Road, Bx. U-38
Storrs, CT 06269-3038

FentonRv

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Jewel Mullen, M.D., M.P.H., M.P.A.
Commissioner

Dannel P. Malloy
Governor
Nancy Wyman
Lt. Governor

May 20, 2015

Mr. Stanley Nolan
University of Connecticut
25 Ledoyt Road
Unit 3252
Storrs, CT 06269-3252

PUBLIC WATER SYSTEM:	**University of Connecticut - Main Campus**
	Mansfield, CT
CLASSIFICATION TYPE:	Community
PWSID:	CT0780021

SUBJECT: Evaluation of a Groundwater Under the Direct Influence (GWUDI) of Surface Water Study for Fenton Well D

Dear Mr. Nolan:

The GWUDI demonstration report that has been prepared on your behalf by Milone & MacBroom, Inc., and submitted for the above referenced well has been reviewed. The demonstration study was performed at the subject well as result of a violation cited during the last sanitary to determine whether or not the source of supply is under the direct influence of surface water. The demonstration study consisted of the following:

- Collection and analysis of four quarterly MPA samples from Fenton Well D.
- Collection and analysis of weekly water samples for total coliform bacteria, E. coli bacteria, physical parameters, and measurements of conductivity and temperature from the source of supply.
- Weekly sampling and analysis of physical parameters and measurements of conductivity and temperature from the surface water body located within 200 feet of the subject wells, which is an unnamed wetland area of significant size.

<u>Discussion of Results:</u>

The report submitted contains the summary of the study, graphs and tables of color, turbidity, pH, temperature, and conductivity readings for both Fenton Well D and the unnamed wetland, and summary of four quarterly MPA test results collected from Fenton Well D. Permission was granted from Connecticut Department of Energy and Environmental Protection (CT DEEP) in order to run Well D for a full year, even during low flow conditions, for the sake of a complete GWUDI evaluation.

The quarterly MPA test results for Fenton Well D (Appendix E) indicated that none of the seven bio-indicators identified in the Drinking Water Section Guidance for the Determination of Groundwater

Under the Direct Influence of Surface Water were found. Iron bacteria were present in the first quarterly MPA sample and may have contributed to a higher detection limit of 2.4 per 100 gallons for that specific sample. The weekly well water samples test results were clean except for a single detection of total coliform bacteria in July 2014. The weekly water samples test results show that there is no consistent correlation between the well water and surface water in terms of temperature, color, turbidity, pH, and conductivity. All quarterly EPA MPA risk rating was rated "Low" risk.

Conclusions:

1. The data and information submitted were analyzed in accordance with the Department of Public Health Drinking Water Section Guidance for the Determination of Groundwater Under the Direct Influence of Surface Water (May 2005).

2. Considering that the MPA test results show a "Low" risk factor for all quarterly sampling events, this office concurs with the assessment specified in the report that UCONN Fenton Well D is not under the direct influence of surface water.

3. This evaluation does not preclude any further assessments of the impact of surface water on the source of supply should future events change existing conditions.

If you have any questions, please contact me at (860) 509-7333.

Sincerely,

Mandy B Smith

Mandy B. Smith
Sanitary Engineer 3
Drinking Water Section

TC/mbs

cc: Mr. Robert L. Miller, Director of Health, Eastern Highlands Health District
Paul J. Radicchi, Certified Operator, NEWUS
Scott Bighinatti, Consultant, Milone & MacBroom, Inc.

APPENDIX G

Safe Yield Study

Groundwater Safe Yield Analysis

University of Connecticut

March 25, 2020

Prepared for:
University of Connecticut
Facilities Operations
25 LeDoyt Road, Unit 3252
Storrs, CT 06269-3252
(860) 486-3113
fo.uconn.edu

MMI #1958-119

Prepared by:
MILONE & MACBROOM, INC.
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773
www.mminc.com

MILONE & MACBROOM

ENGINEERING | PLANNING | LANDSCAPE ARCHITECTURE | ENVIRONMENTAL SCIENCE

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LIST OF ACRONYMS

DPH	Department of Public Health	mgd	Million gallons per day
ft	Foot or Feet	MTS	Mansfield Training School
gpm	Gallons per Minute	RCSA	Regulations of Connecticut State Agencies
HF	High flow		
HP	Horsepower	S	Second
hr	hours	SUB	Submersible
in	Inch or inches	TDH	Total dynamic head
LBG	Leggette, Brashears & Graham, Inc.	UConn	University of Connecticut
LST	Line shaft turbine	USGS	United States Geological Survey

1.0 INTRODUCTION

1.1 Background

The University of Connecticut (UConn) provides the Main Campus and Depot Campus in Mansfield with potable drinking water. Water supply sources include eight groundwater wells (seven active, one emergency) at two wellfields (the Fenton River and Willimantic River wellfields). Figure 1-1 and Figure 1-2 present a location map of the two wellfields.

Safe yield is the maximum dependable quantity of water per unit of time which may flow or be pumped continuously from a source of supply during a critical dry period without consideration of available water limitations. Safe yield analyses have been conducted for UConn's seven active groundwater wells, the results of which are described in the ensuing text. These safe yield analyses represent the first formal calculation of safe yield conducted by UConn for each wellfield, and replace the informal calculations presented in previous *Water Supply Plans*.

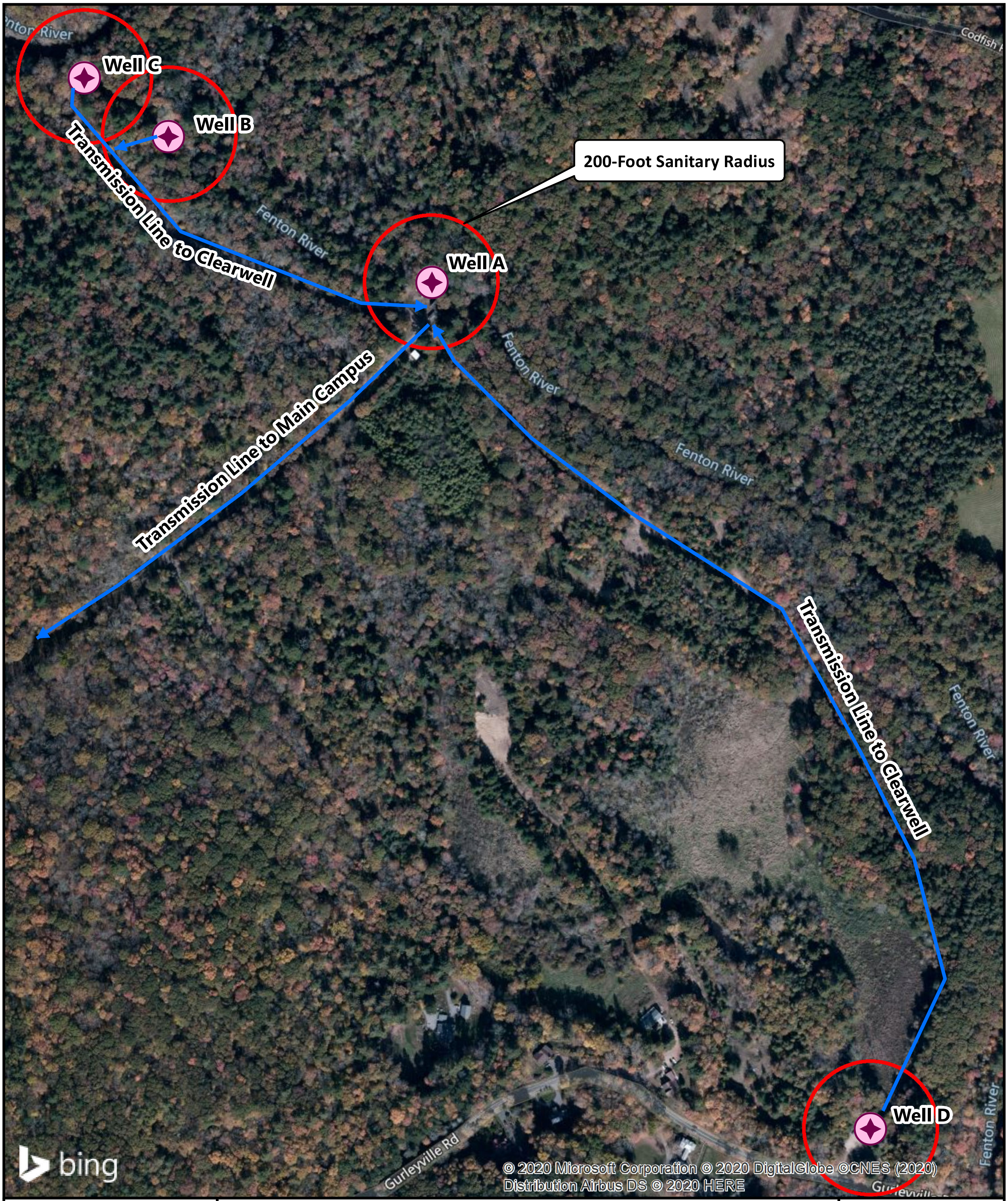
1.2 Groundwater Safe Yield Analysis

UConn maintains seven active wells and one emergency supply wells as part of its overall public water supply system. All of the wells are located in Mansfield, Connecticut. The active sources include the Fenton River Well B, C, and D; and the Willimantic River Well #1, #2, #3, and #4. The emergency source is Fenton River Well A. Well details are summarized in Table 1-1.

Table 1-1
Summary of Production Well Specifications

Well ID	Status	Wellfield Location	Aquifer	Year Installed	Diameter (in)	Total Depth (ft)	Pump Capacity (gpm)	Depth to Pump Intake (ft)	Screened Interval (ft)	Screen Slot Size
A	Emergency	Fenton	Drift	1926	288	28.0	400	28.0	18.0-28.0	Caisson
B	Active	Fenton	Drift	1949	18 x 8	70.0	700	48.2	52.0-70.0	0.090
C	Active	Fenton	Drift	1949	18 x 8	60.0	500	39.2	42.0-60.0	0.090
D	Active	Fenton	Drift	1957	10 x 8	58.5	500	43.5	43.0-58.5	0.045
#1	Active	Willimantic	Drift	1970	30 x 16	77.0	400	71.1	56.5-77.0	0.065
#2	Active	Willimantic	Drift	1974	24 x 14	78.0	210	58.8	68.3-78.0	0.100
#3	Active	Willimantic	Drift	1958	24 x 8	80.3	600	71.2	58.8-80.3	0.045
#4	Active	Willimantic	Drift	1998	20 x 12	65.0	540	56.3	43.0-58.0	0.080

Section 25-32d-4(b) of the Regulations of Connecticut State Agencies (RCSA) present the requirements for calculation of safe yield for groundwater sources. The "Standard Methodology" requires a simultaneous yield test to be conducted on all wells in a wellfield with adjustment for the critical dry period. The UConn wellfields were installed several decades ago and data is unavailable or insufficient to support the Standard Methodology. Therefore, the safe yield analysis for the wellfields herein has been conducted under what is termed the "Alternative Methodology" provided for in the regulations in RCSA Section 25-32d-4(c).



MILONE & MACBROOM
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
WWW.MMINC.COM

FENTON RIVER WELLFIELD

WATER SUPPLY PLAN
UNIVERSITY OF CONNECTICUT

GURLEYVILLE ROAD
MANSFIELD, CT

N

0 400
Feet

SCALE	1 " = 400 '
DATE	5/10/2020
PROJ. NO.	1958-119

FIG. 1-1

Date Saved: 5/10/2020

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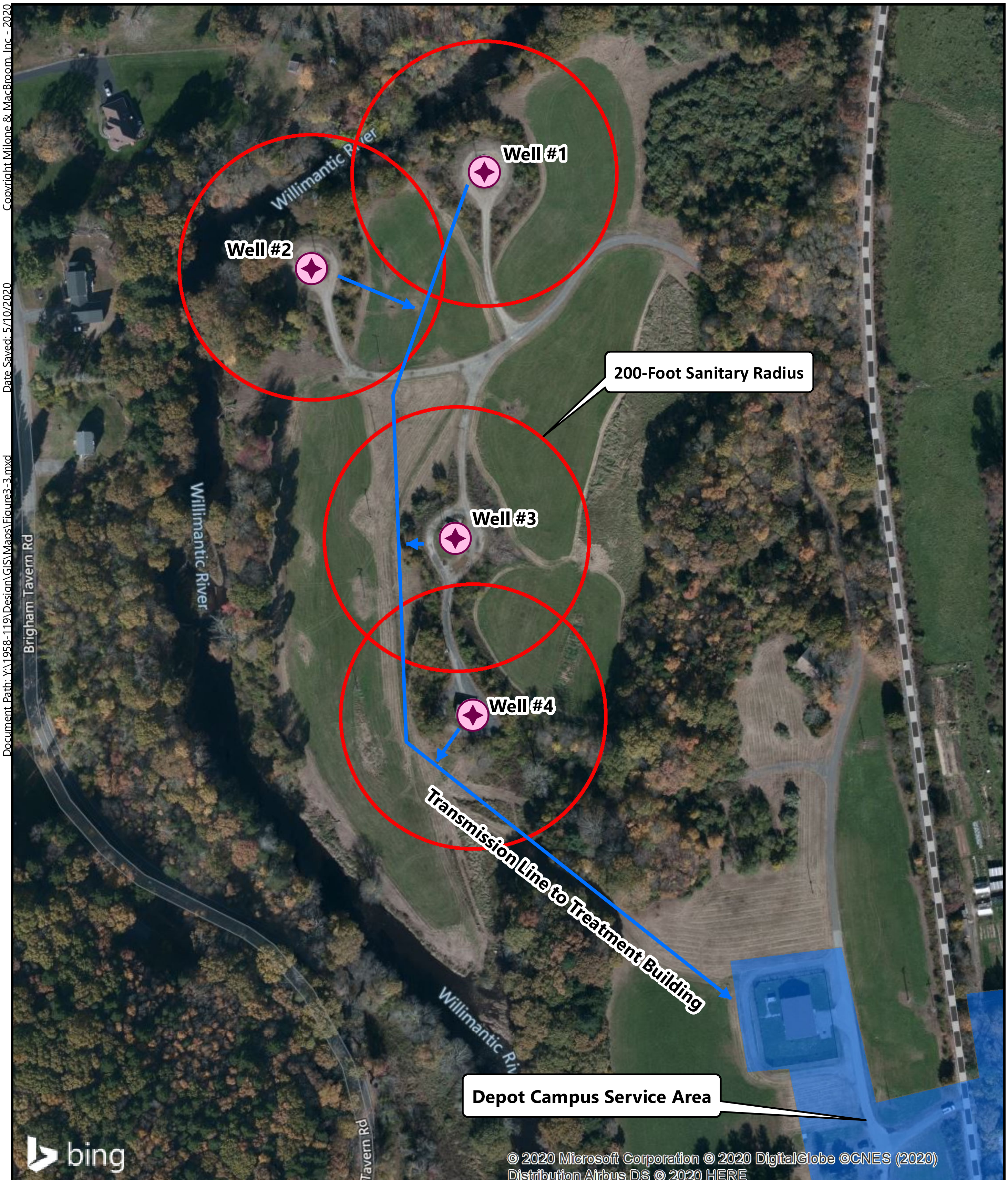

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203.271.1773
WWW.MMINC.COM

WILLIMANTIC RIVER WELLFIELD

WATER SUPPLY PLAN
UNIVERSITY OF CONNECTICUT
SPRING MANOR LANE
MANSFIELD, CT

N

0 200
Feet

SCALE	1 " = 200 '
DATE	5/10/2020
PROJ. NO.	1958-119

FIG. 1-2

As defined in the regulations, **safe yield** means:

> *The maximum dependable quantity of water per unit of time which may flow or be pumped continuously from a source of supply during a critical dry period without consideration of available water limitations.*

As defined in the regulations, **available water** means:

> *The maximum amount of water a company can dependably supply, taking into account the following reductions applied to safe yield: any limitations imposed by hydraulics, treatment, well pump capabilities, reductions of well yield due to clogging that can be corrected with redevelopment, transmission mains, permit conditions, source construction limitations, approval limitations, or operational considerations; and the safe yield of active sources and water supplied according to contract, provided that the contract is not subject to cancelation or suspension and assures the availability of water throughout a period of drought and that the supply is reliable.*

The calculation of safe yield herein is therefore based on aquifer and well characteristics without consideration of available water limitations. Calculations of available water are presented in the UConn *Water Supply Plan.*

The alternative methodology has often been used to calculate the theoretical safe yield of a well by using pumping test data to extrapolate the effect of increased yield on expected drawdown. The Connecticut Department of Public Health (DPH) adopted a recommended procedure for conducting analyses under the Alternative Methodology in April 2015. This procedure is attached as Appendix A. The procedure notes that prediction of higher pumping rates must be in compliance with the following:

- The method is only applicable to wells installed in sand and gravel aquifers;
- Stabilization[1] must be achieved during the pumping test
- The additional yield will not exceed a screen entrance velocity of 0.1 feet per second;
- A safety factor of 5 feet must be maintained above the pump intake;
- The additional drawdown must account for mutual interference effects at other wells in the same wellfield;
- The increase in safe yield is capped at no more than 50% for a wellfield or 100% for an individual well;
- Specific capacity should be adjusted downward for calculations of additional yield; and
- The critical drought multiplier of 75% (18-hour pumping day) must be applied to the adjusted pumping rate.

Based on the Safe Yield Regulations and the Connecticut DPH-adopted procedures above, the safe yield determinations herein utilized numerous data sources including recently completed pumping tests, historical pumping tests, and well construction data. The following steps were generally utilized at each wellfield:

1. The specific capacity of each well in units of gallons per minute per foot (gpm/ft) was calculated using available constant rate pump test data.

[1] RCSA Section 25-32d-1a(39) defines stabilization as a condition measured during a pumping test when no more than a total of 0.25 feet of drawdown occurs over the last 12 hours prior to completion of the test or, where drawdown cannot be determined to that accuracy due to equipment inadequacy, no more than a total of 1.0 foot.

2. For those wells that did not meet stabilization, an analysis and extrapolation of the pumping test drawdown versus time data was performed to show whether there was sufficient storage in the aquifer to sustain the pumping rate for 180 days of continual operation and maintain water levels above the pump intake.

    a. If the extrapolation shows the pump intake would be reached, a reduced pumping rate was calculated based on the specific capacity at the end of the pumping test such that the pumping level at the reduced rate remains above the pump intake.

3. If appropriate, the theoretical additional yield of the well above the installed pumping capacity at the time of the pumping test was evaluated to indicate the maximum well yield attainable with pump replacement, modification, or increased capacity.

    a. The maximum available drawdown remaining was calculated. The depth of the pump intake, minus the extrapolated drawdown, minus a safety factor, was utilized for this calculation. When drought or dry period static water levels were available, this information was also utilized.

    b. Corrections were then made to account for interference effects for multi-well wellfields. This was performed by subtracting the potential interference effect from the available drawdown.

    c. Where step-test or additional pumping test information from the same time period was available, this information was used to determine the potential reduction in specific capacity that typically occurs at higher pumping rates. If additional pumping test information was not available, then specific capacity was reduced by 50% for increased withdrawal rates to account the expected reduction in specific capacity. The 50% decrease is a conservatively greater percentage decline in specific capacity than what is typically expected for a sand and gravel aquifer, and has been utilized for wells in other safe yield evaluations approved by DPH where specific capacity information was limited.

    d. Adjustments were made to ensure that the calculations were consistent with the revised methodology, including ensuring that the maximum screen entrance velocity of 0.1 feet per second would not be exceeded, and that the increase in safe yield from the tested rate did not exceed the 50% (wellfield) or 100% (individual well) limits.

4. A multiplier of 75%, equivalent to an 18-hour pumping day, was applied to the pumping test rate of each well to account for the critical dry period as required by the regulations. An additional multiplier of 90% was not necessary for the UConn wellfields because none of the sources are bedrock wells.

This methodology is consistent with standard and accepted hydrogeologic theory and is also consistent with the methodologies provided for in the safe yield regulations (RCSA Section 25-32d-4(b)) and the Connecticut DPH-adopted procedures.

The alternative methodology under RCSA Section 25-32d-4(c) also allows for historical operational withdrawal and pumping records to be used to assist in the determination of safe yield. UConn indicated that this type of information (multiple days of maximum non-stop withdrawals during severe droughts) is generally not available for its wellfields.

A summary of the safe yield analysis is provided in Table 1-2. The pumping test data, analysis, and calculations are presented in detail in the remainder of this report. Note that as Well A is an emergency well, a safe yield calculation was not performed. It is anticipated that the safe yield information herein will be used to update the appropriate information within the UConn *Water Supply Plan*. Finally, a resume of the analyst conducting the evaluation is included in Appendix B.

Table 1-2
Summary of Groundwater Safe Yield Analysis

Well ID	Previously Reported Safe Yield (mgd)	Test Year	Test Length (hr)	Test Rate (gpm)	Stabilized	Interference	Specific Capacity (gpm/ft)	Specific Capacity Reduction	Final Theoretical Yield (gpm)	Safe Yield (mgd)
A	0.2880	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B	0.6700	1949	49.3	675.0	Yes	Calculated	27.55	51%	838.4	0.9055
C	1.0600	1949	49.3	520.0	Yes	Calculated	27.37	7%	718.6	0.7761
D	0.3500	1957	73	500	Recovering	None	16.00	2%	450.2	0.4862
Total for Fenton River Wellfield									**2,007.2**	**2.1678**
#1	0.8090	1999	121.5	286.6	No	Calculated	23.88	50%	559.7	0.6045
#2	0.3900	1974	48.0	361.0	Assumed	Calculated	8.90	0%	280.3	0.3027
#3	0.7830	1999	121.5	281.8	Yes	Calculated	21.62	52%	550.3	0.5943
#4	0.8060	1999	121.5	414.0	Yes	Calculated	17.18	50%	624.8	0.6748
Total for Willimantic River Wellfield									**2015.1**	**2.1763**
Total for All Wells									**4,022.3**	**4.3441**

2.0 FENTON RIVER WELLFIELD SAFE YIELD ANALYSIS

The Fenton River Wellfield is located in the UConn Forest adjacent to the Fenton River north of Gurleyville Road. The geology at the wellfield consists a variety of unconsolidated surficial materials including stratified glaciofluvial deposits as well as more recent alluvium. The aquifer is underlain by glacial till and granofels (Lower member of the Bigelow Brook formation) near Wells A, B, and C and schist and gneiss (Hebron gneiss) near Well D[2]. Boring logs are included in Appendix C.

Well A was installed in 1926 to provide water service to the University and replace the use of previous sources of water supply that are believed to be shallow dug wells and sand-filtered surface water from Pink Ravine on Cedar Swamp Brook (from 1921-1927). Well B and C were installed in the late 1940s approximately 900 and 1,200 feet upstream of Well A, respectively, and Well D was installed approximately 3,000 feet downstream near Gurleyville Road in the late 1950s. All of the Fenton River wells pump into a 50,000-gallon raw water concrete clearwell (installed in 1949) before being pumped to the distribution system. Recent redevelopment details for each well are presented below:

- Well A is currently inactive and will only be used in the case of an emergency. The date of the last redevelopment is not known. The well pump is a Fairbanks Morse turbine pump (Serial # SJ4185) installed in 1977 that could formerly produce 400 gpm at 38 feet of total dynamic head (TDH).

- Well B was last redeveloped by S. B. Church Company in 2015. All new well casing, 18-feet of 8-inch diameter telescoping stainless steel 0.090-slot well screen with No. 4 gravel pack was installed. The well depth was measured at 71 feet from the top of the concrete pier in the pumphouse. A new line shaft turbine (LST) pump was installed to a depth of 49 feet, 2 inches with the depth gage set at 45 feet. The 10 HP pump has a pumping rate of approximately 400 gpm at 45 feet of TDH. Following redevelopment, the well was pumped to waste at 400 gpm with a pumping level of 23 feet and a specific capacity of 26.6 gpm/foot.

- Well C was last redeveloped by S. B. Church Company in 2015. All new well casing, 18-feet of 8-inch diameter telescoping stainless steel 0.090-slot well screen with No. 4 gravel pack was installed. The well depth was measured at approximately 61 feet from the top of the concrete pier in the pumphouse. A new line shaft turbine pump was installed to a depth of 39 feet, 2 inches with the depth gage set at 35 feet. The 10 HP pump has a pumping rate of approximately 400 gpm at 40 feet of TDH. Following redevelopment, the well was pumped to waste at 400 gpm with a pumping level of 21 feet and a specific capacity of 36.3 gpm/foot.

- Well D was last redeveloped by S. B. Church Company in 2007. The well was relined to be 10-inches in diameter with 15.5 feet of 8 inch diameter, 0.045-slot screen. In 2015, the pump was pulled for service. The well depth was measured at approximately 58.5 feet from the top of the concrete pier in the pumphouse. The line shaft turbine pump was installed to a depth of 43.5 feet. The 25 HP pump has a pumping rate of approximately 354 gpm at 66 feet of TDH. Following redevelopment, the well was pumped at 354 gpm with a drawdown of 14.81 feet and a specific capacity of 23.9 gpm/foot.

Table 2-1 presents details regarding the Fenton wells. Production well logs, pump curves, and other documentation regarding the wells is presented in Appendix C.

[2] Rodgers, J., 1985, *Bedrock Geologic Map of Connecticut*, Connecticut Geological and Natural History Survey in Cooperation with the U.S. Geological Survey.

Table 2-1
Summary of Fenton River Wells

Well.	Year Drilled	Well Diameter (in)	Depth (ft)	Screen Details	Gravel Pack	Pump Setting (ft)	Pump Type	Pump Capacity (gpm)	Previously Reported Safe Yield (mgd)
A	1926	288	28.0	18-28 feet, Caisson	No	28.0	5 HP LST	400	0.2880
B	1949	18x8	70.0	52-70 feet, 0.090 slot	Yes, #4	48.2	10 HP LST	400	0.6700
C	1949	18x8	60.0	42-60 feet, 0.090 slot	Yes, #4	39.2	10 HP LST	400	1.0600
D	1957	10x8	58.5	43.0-58.5 feet, 0.045 slot	Yes	43.5	25 HP LST	354	0.3500

Note: HP – Horsepower, LST = Line Shaft Turbine

2.1 Pumping Tests

Pumping tests of the Fenton River Wellfield include individual yield tests of each well as well as some simultaneous yield tests of more than one well.

- Well A Report, 1942: A document titled "Report on Water Supply System University of Conn." This summary of a study conducted between 1940 and 1942 indicates that two 500 gpm electric centrifugal pumps (one active, one standby) and a 200 gpm emergency gasoline-powered pump were installed in Well A. The well yield with this system was approximately 0.330 mgd over 11 hours to meet the average daily demand at that time of approximately 0.280 mgd. The report noted that the reported yield of the well was approximately 400 gpm at four feet above suction and about 460 gpm at suction such that the pumps were oversized. The report concludes that the yield of Well A is at least 400 gpm but not much higher due to the following:

    - On November 29 of an unknown year: Pump was run for 9.5 hours at 518 gpm and the well was pumped dry.
    - On November 30 of an unknown year: Pump was run for 10.75 hours at 441 gpm and drawdown reached 2 ft above the bottom of the well; drawdown was not stable.

- Well B and C Simultaneous Pump Test, 1949: These wells were installed by R. E. Chapman Company. Simultaneous pumping testing of Well B and Well C was conducted by R. E. Chapman Company from March 14, 1949 at approximately 2:00 pm through March 18, 1949 at 10:30 am. Antecedent conditions were not recorded and it is not known if rainfall occurred during the pumping test. Well B was pumped at 520 gpm and Well C was pumped at 520 gpm until March 15 at 11:45 pm, at which point the pumping test was suspended to replace the pump in Well B with a larger pump. The pumping test was restarted on March 16 at 9:15 am with Well B pumping at 675 gpm and Well C pumping at 520 gpm for the final 49.25 hours of pumping. The static groundwater levels were 2.7 feet in Well B and 5.3 feet in Well C. While there is no data provided on Well A in the report, it is assumed that it was pumping during the pumping test, into the existing system, to meet demand. Observation well monitoring and recovery data are available.

- The pumping level at the end of the test in Well B was 27.2 feet for a drawdown of 24.5 feet, representing a specific capacity of 27.55 gpm/ft.

- The pumping level at the end of the test in Well C was 24.3 feet for a drawdown of 19.0 feet, representing a specific capacity of 27.37 gpm/ft.

- <u>Test Well #9 Pump Test, 1949</u>: This test well was installed by R. E. Chapman Company. A 39.7-hour pumping test of 8-inch diameter Test Well #9 was performed at the current location of Well D from January 10, 1949 at 4:30 pm to January 12, 1949 at 8:10 am. The well was pumped at a constant rate of 400 gpm and groundwater levels were monitored at three observation wells. Pumping test data are available. The static groundwater level was 9.2 feet. The pumping level at the end of the test was 23.3 feet for a drawdown of 14.1 feet, and this level was stable for 25.5 hours, representing a specific capacity of 28.37 gpm/ft.

- <u>Well D Initial Pump Test, 1957</u>: This well was installed by R. E. Chapman Company. A 72.5-hour pumping test of Well D was conducted by R. E. Chapman Company from December 4, 1957 at 8:00 am to December 7, 1957 at 8:30 am. Antecedent conditions were not recorded but no rainfall occurred during the pumping test. Water was pumped at 520 gpm for the first 47 hours, and then reduced to 400 gpm for the final 25.5 hours. The static groundwater in the well prior to pumping was 10.0 feet. Pumping test data are available, including observation well monitoring data and recovery data. Water levels were recovering slightly at the end of the pumping test. The pumping level at the end of the test in Well D was 35.0 feet for a drawdown of 25.0 feet, representing a specific capacity of 16.00 gpm/ft.

- <u>Fenton Wellfield Step Tests, 1999</u>: Independent step-drawdown tests of the Fenton River wells were conducted on September 22 and September 23, 1999 by Leggette, Brashears & Graham, Inc. (LBG). Results were graphed and projected outward to five days in order to determine the potential individual sustainable yield of each well without drawdown to the well screens or pump intakes. Water was pumped into the distribution system with each step lasting between 30 and 60 minutes.

  - Well A was pumped at 97 gpm, 227 gpm, 312 gpm, and 352 gpm. Five-day sustainable yield was reported as 200 gpm based on LBG's interpretation of the monitoring data.

  - Well B was pumped at 190 gpm, 274 gpm, 380 gpm, and 499 gpm. Five-day sustainable yield was reported by LBG as 500 gpm. LBG noted that Well B and C showed interference effects, and that if both were pumped concurrently, the sustainable yield of each would decline.

  - Well C was pumped at 123 gpm, 217 gpm, 354 gpm, and 406 gpm. Five-day sustainable yield was reported as 400 gpm. LBG noted that Well B and C showed interference effects, and that if both were pumped concurrently, the sustainable yield of each would decline.

  - Well D was pumped at 200 gpm, 285 gpm, 362 gpm, and 448 gpm. LBG reported the five-day sustainable yield to be 450 gpm.

- <u>Well B Level A Mapping Aquifer Parameter Pumping Test, 1999</u>: A 72-hour pumping test of Well B was conducted by LBG from November 16, 1999 at 11:45 am to November 19, 1999 at reportedly 11:45 am. The wellfield was shut down prior to the test on November 12. The only precipitation that occurred between November 13 and 19 was 0.1 inches on November 16. Fenton River Well B was pumped at a rate 517 gpm. While summaries and graphs of the pumping test are available in the 2002 Fenton Level A Report, tables of pumping test data have not been located and are believed unavailable at this time. The impact of pumping of Well B on each of the four Fenton River Wells is described below:

- Well B: Drawdown stabilized at 20.5 feet over the last 12 hours, representing a specific capacity of 25.22 gpm/ft.

- Well C: Drawdown of 2.0 feet.

- Well A: Water level unaffected.

- Well D: Unmonitored, but assumed unaffected as it is farther away from Well B than Well A

- Well C and Well D Level A Mapping Induced Infiltration Test, 2000: An eight-day pumping test of Well C and Well D was conducted by LBG from September 11, 2000 at 12:15 pm to September 19, 2000 at reportedly 12:15 pm. The wellfield was shutdown prior to the test on September 8. A total of 0.5 inches of rainfall was recorded during the background period (September 9). During the pumping test, 0.24 inches of rainfall was recorded on September 12, and 1.8 inches of rainfall was recorded on September 15. Thus, the pumping test was extended from the original five days to eight days in duration. Well C was pumped at 405 gpm and Well D at 165 gpm (combined rate was 570 gpm) during the test. While summaries and graphs of the pumping test are available in the 2002 Fenton Level A Report, tables of pumping test data have not been located. The impact of pumping on each of the four Fenton River Wells is described below:

  - Well C: Drawdown did not stabilize over the last 12 hours of pumping, with a final drawdown value of 15.2 feet representing a specific capacity of 26.64 gpm/ft.

  - Well D: Drawdown did not stabilize over the last 12 hours of pumping, with a final drawdown value of 14.1 feet representing a specific capacity of 11.70 gpm/ft. Pumping of Well D is not anticipated to have caused interference near Well A, B, or C.

  - Well B: Water level drawn down 2.5 feet due to pumping at Well C.

  - Well A: Unmonitored, but assumed to be slightly affected by pumping of Well C based on drawdown at nearby monitoring well 9-99 (approximately 0.40 feet).

- Fenton River Study Data Collection, 2004: In March 2004 and July-August 2004 a series of informal pumping tests were conducted by UConn researchers to measure the response of groundwater to pumping of each Fenton well independently. Water levels were monitored at observation wells. Pumping test data are not available.

  - March Pumping Test
    - Well B: March 4-30, 2004 – 560 gpm average pumping rate.

  - August Pumping Tests
    - Well A: August 2-6, 2004 – 270 gpm average pumping rate.
    - Well B: July 26-30, 2004 – 560 gpm average pumping rate.
    - Well C: August 9-13, 2004 – 375 gpm average pumping rate.
    - Well D: August 30-September 2, 2004 – 346 gpm average pumping rate.

- *Wellfield Management Plan* Pumping Test of Well D, 2010: In order to collect field data to confirm numerical modeling of Fenton Well D, the well was activated on September 8, 2010 for seven days pumping at an average rate or 241.7 gpm. Pumping occurred for 18 hours each day with a six hour shutdown similar to the numerical model. Milone & MacBroom, Inc. measured groundwater levels at observation wells (but not in Well D), and measured streamflow in the Fenton River. Note that no influence of pumping was noted near Well A.

- Low-Flow Study of Fenton Well D Pumping Test, 2015: A five-day pumping test of Well D was conducted by Milone & MacBroom, Inc. from August 28 to September 2, 2015 to evaluate induced infiltration due to pumping. Well D was set to pump into the system at 242 gpm and ran constantly throughout the test with the exception of a brief shutdown overnight from August 30 to 31. Pumping test data are available, but stabilization was not achieved. Note that no influence of pumping was noted at monitoring wells near Well A. Final drawdown was 23.0 feet, representing a specific capacity value of 10.52 gpm/ft.

The constant rate pumping test data above are summarized in the following table.

Table 2-2
Summary of Pumping Test Data at Fenton River Wells

Well	Test Year	Test Length (hr)	Pumping Test Rate (gpm)	Static Water Level (ft)	Stabilized?	Drawdown (ft)	Final Water Level (ft)	Specific Capacity (gpm/ft)
B & C	**1949**	**49.3**	**Well B – 675.0** **Well C – 520.0**	**2.7** **5.3**	**Yes**	**24.5** **19.0**	**27.2** **24.3**	**27.55** **27.37**
D**	1949	39.7	400.0	9.2	Yes	14.1	23.3	28.37
D	**1957**	**72.5**	**400.0**	**10.0**	**Recovering**	**25.0**	**35.0**	**16.00**
B	1999	72.0	517.0	Unknown	Yes	20.5	Unknown	25.22
C & D	2000	192.0	Well C – 405.0 Well D – 165.0	Unknown	No	15.2 14.1	Unknown	26.64 11.70
D	2015	120.0	242.0	28.0***	No	23.0	5.0***	10.52

*Estimated from report.
**8-inch diameter test well at the site of Well D.
***Water levels measured on airline gage in pumphouse.
Note: Pumping tests used for the safe yield analysis are in **bold** text.

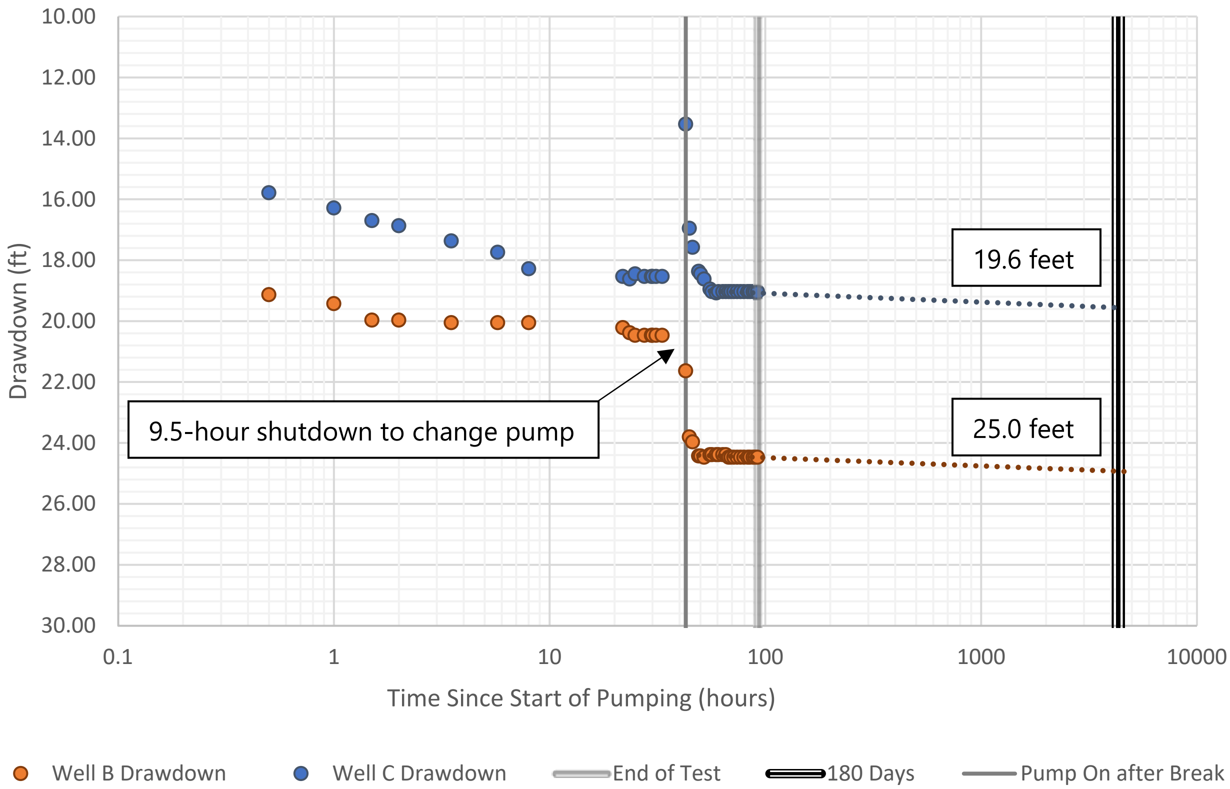
Based on the above, a simultaneous pumping test of all four wells does not exist for the Fenton River Wellfield. Furthermore, tests with sufficient water level data are not available for Well A, and several of the tests either did not stabilize or are of insufficient length for directly evaluating safe yield (even if they were sufficient for other purposes such as initial yield testing or Level A mapping). Thus, a combination of pumping tests will be necessary to evaluate safe yield. Note the following:

- Well A is no longer an active well, so its safe yield cannot be applied to the calculation of available water for the Fenton River Wellfield. Therefore, there is no need for an evaluation of safe yield for Well A at this time.

- The data for several pumping tests note that interference effects do not appear to be present between Wells A, B, and C and Well D due to Well D being nearly 3,000 feet downstream. This is confirmed through interference calculations (Section 2.3).

- While the 1949 simultaneous pumping test for Well B and Well C technically stabilized, the length of the test (following the approximately 9.5-hour mid-test shutdown which cannot be considered brief) is less than 72-hours. Therefore, this data must be extrapolated to represent a stabilized drawdown condition. Figure 2-1 presents the extrapolation which results in a stabilized drawdown of 25.0 feet for Well B and 19.6 feet for Well C, equivalent to stabilized water levels of 27.7 feet for Well B and 24.9 feet for Well C.

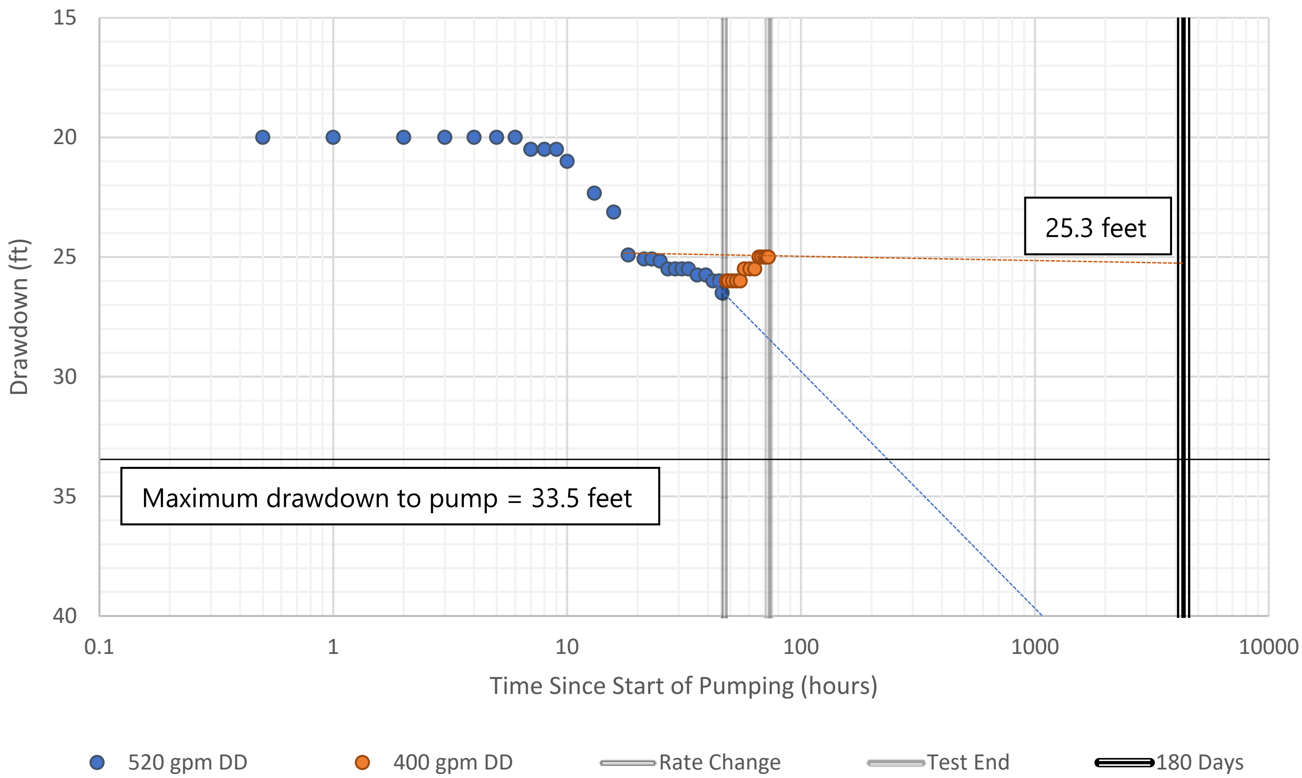
Figure 2-1
Drawdown vs. Time Plot for 1949 Pumping Test of Well B and Well C



- Similarly, the 1957 pumping test for Well D shows that water levels were slightly recovering at the end of the test due to the rate reduction. However, because a shutdown was not necessary to change the pumping rate, the data is useful. A comparison of extrapolations of the pumping test data at 520 gpm and 400 gpm is appropriate. Figure 2-2 presents the extrapolation. The extrapolated drawdown at 520 gpm does not appear sustainable as it would draw down below the pump, but the extrapolated drawdown at 400 gpm results in a stabilized drawdown of 25.3 feet (stabilized water level of 35.3 feet) for Well D.

- Finally, all of the pumping test data predate the current well characteristics (namely, screens reduced to eight inches in diameter). However, this can be accounted for by meeting the DPH guidance requirement for screen entrance velocity.

Figure 2-2
Drawdown vs. Time Plot for 1957 Pumping Test of Well D



Based on the above discussions, the 1949 simultaneous pumping test of Well B and Well C and the 1957 pumping test best represent the safe yield requirements. These data have been selected for use in the safe yield analysis. Data associated with each of these tests is included in Appendix C.

2.2 Maximum Additional Drawdown Available

Based on the individual yield tests above, the maximum additional available drawdown in the three Fenton River wells has been calculated:

Table 2-3
Maximum Additional Available Drawdown Calculation

Well No.	Pump Depth (ft)		Stabilized Water Level (ft)		Safety Factor (ft)		Maximum Additional Available Drawdown (ft)
B	48.2	-	27.7	-	5.0	=	15.5
C	39.2	-	24.9	-	5.0	=	9.3
D	43.5	-	35.3	-	5.0	=	3.2

The maximum additional available drawdown for each well is positive, indicating that the tested yield may be too low relative to theoretical safe yield when the pump setting and safety factors are considered. The maximum theoretical pumping rate will be calculated later in this analysis to correct for the additional available drawdown.

2.3 Interference Effects

As noted in Section 2.1, several pumping tests include monitoring of water levels at observation wells. Note the following:

- The 1949 pumping test of Well B and Well C accounts for mutual interference between Well B and Well C at the pumping rates of 675.0 gpm and 520.0 gpm, respectively.

- The 1999 pumping test of Well B resulted in 2.31 feet of drawdown at Well C when Well B was pumping at 517.0 gpm. Well A was not affected by pumping, and Well D is farther away than Well A. Therefore, Well D was not affected by pumping of Well B at 517.0 gpm.

- The 2000 pumping test of Well C (and Well D) resulted in 2.53 feet of drawdown at Well B when Well C was pumping at 405.0 gpm. However, the drawdown in Well C was not stable. After extrapolation to 180 days, the drawdown in Well B would be 4.25 feet at a pumping rate of 405.0 gpm in Well C.

- Well D is located nearly 3,000 feet downstream of Well A. Geophysical data collected as part of the Fenton River Study revealed a relatively narrow constriction in the bedrock surface between Wells B and C and Well D, which partially separates the aquifer. The study concludes that the areas of influence of these wells are therefore independent[3].

- During the 2010 pumping test of Well D, observation wells south of Well A were recovering and were not affected by pumping of Well D. Therefore, Well A, Well B, and Well C (located further north than the observation wells) were not affected by pumping of Well D at 241.7 gpm. Similar results were noted during the 2015 pumping test of Well D, consistent with the assessment in the Fenton River Study.

Note that the 1949 pumping test rates are greater than those for the 1999 & 2000 test rates where interference was directly measured. Therefore, the "initial" mutual interference effects between Well B and Well C during the 1949 pumping test are already higher than the values listed above. However, additional interference between the production wells will occur as pumping rates increase above the tested rates. The interference between the two production wells during the 1949 pumping test has been estimated based on the 1999 and 2000 test rates and drawdowns assuming a linear relationship based on the inverse of specific capacity. A summary of the interference effects calculated at each well is presented below:

- Well B is affected by interference with Well C (4.25 feet) when Well C is pumping at 405.0 gpm, or by 0.010 feet/gpm. When Well C is pumping at 520 gpm, interference in Well B would be 5.5 feet.

- Well C is affected by interference with Well B (2.31 feet) when Well B is pumping at 517.0 gpm, or by 0.004 feet/gpm. When Well B is pumping at 675 gpm, interference in Well B would be 3.1 feet.

[3] Warner, G. S., Ogden, F. L., Bagtzoglou, A. C., and Parasiewicz, P., *Long-Term Impact Analysis of the University of Connecticut's Fenton River Water Supply Wells on the Habitat of the Fenton River*, University of Connecticut.

- Well D is not affected by interference from other wells.

The above interference calculations are used in the next section to evaluate additional interference from the additional available drawdown.

2.4 Additional Available Drawdown after Accounting for Interference Effects

The calculated "initial" interference effects at each well were subtracted from the maximum additional available drawdown to calculate "initial" additional available drawdown at each well as presented below. Note that in this case, the initial interference effects are zero because Well B and Well C were pumped simultaneously, and Well D does not affect, nor is affected by, Well B and Well C.

Table 2-4
Initial Additional Available Drawdown Calculation

Well No.	Maximum Additional Available Drawdown (ft)		Initial Interference Effect (ft)		Initial Additional Available Drawdown (ft)
B	15.5	-	0.0	-	15.5
C	9.3	-	0.0	-	9.3
D	3.2	-	0.0	-	3.2

Additional interference effects are likely when the additional available drawdown is realized, because the cone of depression for each well will be larger. The additional interference effects at each well have been calculated based on the percentage of interference effects to the drawdown that occurred during each pumping test. The additional interference calculations are rounded up to be conservative.

Table 2-5
Additional Interference Calculation

Well No.	Individual Initial Interference Effect (ft)		Test Drawdown (ft)		Percentage		Initial Additional Available Drawdown (ft)		Additional Interference (ft)
B	5.5	/	25.0	=	0.220	x	15.5	=	3.4
C	3.1	/	19.6	=	0.158	x	9.3		1.5
D	0.0	/	25.3	=	0.000	x	3.2		0.0

The additional interference is then subtracted from the initial additional available drawdown to calculate the final additional available drawdown available in each well.

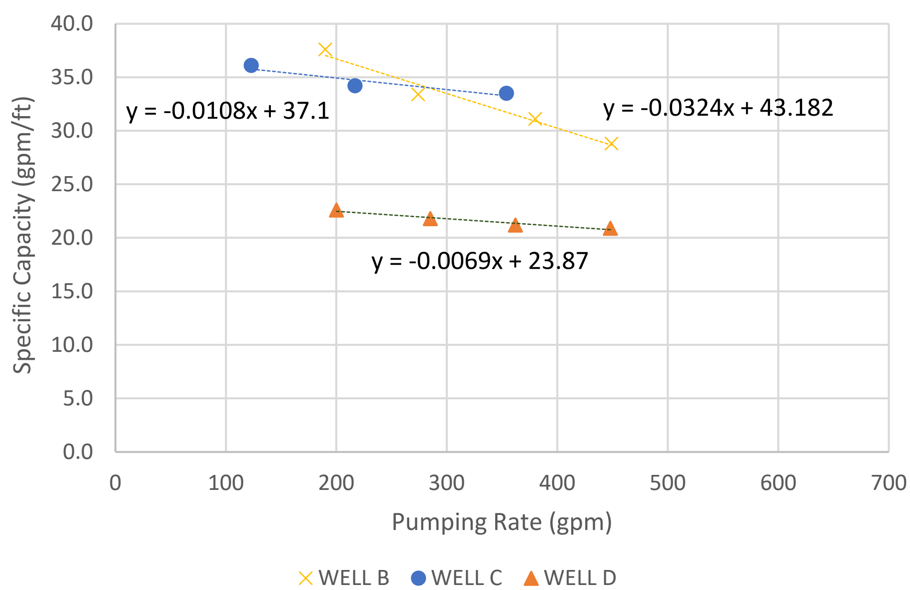
Table 2-6
Final Additional Available Drawdown Calculation

Well No.	Initial Additional Available Drawdown (ft)		Additional Interference (ft)		Final Additional Available Drawdown (ft)
B	15.5	-	3.4	=	12.1
C	9.3	-	1.5	=	7.8
D	3.2	-	0.0	=	3.2

2.5 Specific Capacity Reduction

Figure 2-3 presents specific capacities for each production well based on the 1999 step test data.

Figure 2-3
Specific Capacity Data - 1999 Step Tests



The 1999 step test data for Well B, Well C, and Well D demonstrate decreasing specific capacity with increasing pumping rate, as expected. The linear trendline equations on the graph are used in the next section to correct the additional available yield of each production well from the final additional available drawdown.

2.6 Theoretical Yield

The maximum theoretical yield for each well at the Fenton River Wellfield was calculated using the pumping rates sustained during the 1949 and 1957 pumping tests, the final additional available drawdown calculated above, and the specific capacity reduction in Figure 2-3. First, the initial additional available yield is calculated based on the specific capacity during the individual pumping tests, which is added to the pumping test rates to determine maximum theoretical yield for each production well.

Table 2-7
Initial Additional Available Yield Calculation

Well No.	Specific Capacity (gpm/ft)		Final Additional Available Drawdown (ft)		Initial Additional Available Yield (gpm)		Pumping Test Rate (gpm)		Maximum Theoretical Yield (gpm)
B	27.55	x	12.1	=	333.4	+	675.0	=	1,008.4
C	27.37	x	7.8	=	213.5	+	520.0	=	733.5
D	16.00	x	3.2	=	51.2	+	400.0	=	451.2

Based on the specific capacity equations for each production well in Figure 2-3 and the maximum theoretical yield for each well calculated above, the following reductions in specific capacity would occur when increasing the pumping rate to these theoretical yields:

- Based on the linear trendline for Well B, the specific capacity at a yield of 1008 gpm (10.52 gpm/ft) is 49% of the specific capacity at a yield of 675 gpm (21.31 gpm/ft). Thus, the specific capacity reduction for increasing the yield at Well B is 51%.

- Based on the linear trendline for Well C, the specific capacity at a yield of 734 gpm (29.17 gpm/ft) is 93% of the specific capacity at a yield of 520 gpm (31.48 gpm/ft). Thus, the specific capacity reduction for increasing the yield at Well C is 7%.

- Based on the linear trendline for Well D, the specific capacity at a yield of 452 gpm (20.75 gpm/ft) is 98% of the specific capacity at a yield of 400 gpm (21.11 gpm/ft). Thus, the specific capacity reduction for increasing the yield at Well D is 2%.

The specific capacity reduction is applied to the initial additional available yield in order to determine the yield reduction due to the decrease in specific capacity from increasing the pumping rate of each production well. The resulting additional available yield is then added to the pumping test rate to determine the adjusted theoretical yield for each well.

Table 2-8
Yield Reduction Due to Specific Capacity Reduction

Well No.	Initial Additional Available Yield (gpm)		Specific Capacity Reduction		Yield Reduction (gpm)
B	333.4	x	0.51	=	170.0
C	213.5	x	0.07	=	14.9
D	51.2	x	0.02	=	1.0

Table 2-9
Adjusted Theoretical Yield Calculation

Well No.	Initial Additional Available Yield (gpm)		Yield Reduction (gpm)		Additional Available Yield (gpm)		Pumping Test Rate (gpm)		Adjusted Theoretical Yield (gpm)	With 100% Increase Cap (gpm)
B	333.4	-	170.0	=	163.4	+	675.0	=	838.4	838.4
C	213.5	-	14.9	=	198.6	+	520.0	=	718.6	718.6
D	51.2	-	1.0	=	50.2	+	400.0	=	450.2	450.2
					Total		**1,595.0**		**2,007.2**	**2,007.2**

Note that the DPH procedures restrict the increase in safe yield at no more than 100% for an individual well. The adjusted theoretical yield for each individual well is within the 100% limit. Thus, none of the adjusted theoretical yields needed to be reduced by this restriction.

Furthermore, the DPH procedures require that screen entrance velocity does not exceed 0.1 feet per second. The surface area of each well screen was calculated based on the equation for the surface area of a cylinder, A = 2*π*radius*height, which neglects the top and bottom of the cylinder:

- For Well B, the area of the outer well screen is 5,428.7 square inches. Based on the "hi flow" screen specification information from Johnson Well Screens (Appendix D), the screen in Well B has an intake area of approximately 170 in^2/ft or 3,051.0 square inches. Multiplying this by 0.1 ft/s, the flow would be 127.1 cubic feet per minute or 950.8 gpm.

- For Well C (which has similar screen to Well B), the area of the outer well screen is 5,428.7 square inches. Based on the "hi flow" screen specification information from Johnson Well Screens (Appendix D), the screen in Well C has an intake area of approximately 170 in^2/ft or 3,051.0 square inches. Multiplying this by 0.1 ft/s, the flow would be 127.1 cubic feet per minute or 950.8 gpm.

- For Well D, the area of the outer well screen is 4,674.7 square inches. Based on the "hi flow" screen specification information from Johnson Well Screens (Appendix D), the screen in Well D has an intake area of approximately 110 in^2/ft or 1,705.0 square inches. Multiplying this by 0.1 ft/s, the flow would be 71.0 cubic feet per minute or 531.1 gpm.

Based on the intake area of the screens, the screen entrance velocity does not limit the theoretical yields of Well B, Well C, or Well D.

Finally, the DPH procedures require that the maximum increase in theoretical yield for this wellfield must be capped at no more than 50% above the combined pumping test rates, or 2,392.5 gpm. As sum of the adjusted theoretical yields are less than the maximum 50% increase cap for the entire wellfield, the following yields are the final theoretical yields for the wellfield.

Table 2-10
Capped Theoretical Yield Calculation

Well No.	Pumping Test Rate (gpm)	Adjusted Theoretical Yield (gpm)	With 100% Increase Cap (gpm)	With Screen Entrance Velocity Cap (gpm)	Final Theoretical Yield (gpm)
B	675.0	838.4	838.4	838.4	838.4
C	520.0	718.6	718.6	718.6	718.6
D	400.0	450.2	450.2	450.2	450.2
Total	**1,595.0**	**2,007.2**	**2,007.2**	**2,007.2**	**2,007.2**

2.7 Critical Dry Period Adjustment

The final theoretical yield for each well at the Fenton River Wellfield as calculated on the basis of the individual pumping tests was adjusted for the critical dry period by using the standard 75% multiplier representing an 18-hour pumping day. The additional 90% multiplier was not applicable because these wells are drilled into stratified drift. A summary table is presented below.

Table 2-11
Safe Yield Calculation for Fenton River Wellfield

Well No.	Final Theoretical Yield (gpm)	Final Theoretical Yield (mgd)		18-Hour Pumping Day Multiplier		Bedrock Well Multiplier		Safe Yield (mgd)
B	838.4	1.2073	x	0.75	x	1.00	=	0.9055
C	718.6	1.0348	x	0.75	x	1.00	=	0.7761
D	450.2	0.6483	x	0.75	x	1.00	=	0.4862
Total for Fenton River Wellfield								**2.1678**

The calculated safe yield for the Fenton River Wellfield (Well B, Well C, and Well D) is **2.1678 mgd**. This is higher than the interim safe yield estimated in the 2011 *Water Supply Plan* (1.56 mgd) as it is based on extrapolation of historic pumping tests as opposed to directly using recent pumping test rates. The combined safe yield is greater than the combined diversion registration for the wellfield (0.8443 mgd), even though the individual safe yields are less than the registered vales for Well B and Well D.

Note that if UConn decides to bring the Well A back online, historic pumping test data is generally not available for Well A. Regardless of whether Well A is brought back online directly or replaced, the work should include, at a minimum, a pumping test of Well A (or its replacement) conducted with the other wells offline (although preferably in conjunction with pumping tests at Well B and Well C). A minimum 72 hour pumping test will be necessary that includes monitoring of water levels in the four production wells. This test should be conducted in accordance with the Safe Yield Regulations to the extent possible.

Note further that the screen entrance velocity restriction would not apply if a simultaneous pumping test of all three production wells the wellfield were conducted. If UConn believes that pumping the wellfield at a rate greater than 2.8894 mgd is feasible, then such a pumping test may be warranted to increase safe yield.

3.0 WILLIMANTIC RIVER WELLFIELD SAFE YIELD ANALYSIS

The Willimantic River Wellfield is located on Spring Manor Farm off of Spring Manor Lane. The Farm is to the west of Route 32 and north of Route 44 in Mansfield, Connecticut. The geology at the wellfield consists a variety of unconsolidated surficial materials including stratified glaciofluvial deposits as well as more recent alluvium. The aquifer is underlain by glacial till and schist and gneiss (Brimfield Schist) near Wells #1, #2, and #3 and schist and gneiss (Hebron gneiss) near Well #4[4]. Boring logs are included in Appendix E.

The Willimantic River Wellfield was originally constructed by Mansfield Training School (MTS). MTS Well #1 was a 20-foot wide caisson well installed around 1913 and used through 1961. The well was ultimately abandoned in 1998. MTS Well #2 was installed in 1948 and MTS Well #3 was installed in 1958 to augment, and eventually replace, MTS Well #1.

In 1969, UConn reached an agreement with MTS whereby MTS would provide the Willimantic River Wellfield to UConn in exchange for the provision of water service. MTS retained MTS Well #2 as a backup well, and UConn renamed MTS Well #3 to Well #3. UConn subsequently developed Well #1 in 1970 and Well #2 in 1974 to provide additional supply to the Storrs campus.

After MTS was closed by the State of Connecticut in 1993, MTS Well #2 came under the control of UConn. UConn constructed Well #4 within approximately 10 feet to replace the function of MTS Well #2. MTS Well #2 still exists as a monitoring point within the pumphouse, but is physically disconnected from all infrastructure associated with the water system.

Water from the four Willimantic River Wellfield wells pumps to a treatment building before being pumped into the distribution system. Note that each well is located on a high mound to ensure that the wellheads are above the elevation of the 1% annual chance flood. Thus, the original well depths for Well #1, Well #2, and Well #3 reported in various reports may not reflect the extension of the wellheads to the current grades, as they were originally drilled without the mounds being present. Recent redevelopment details for each well are presented below:

- Well #1 was last redeveloped by S. B. Church in August 2018. The well was cleaned and redeveloped and the turbine pump and motor were replaced. The well depth was noted as being 77 feet from the pumphouse with 20.5 feet of 16-inch diameter screen. The current pump setting is 71.1 feet. Following redevelopment, the well had a specific capacity of approximately 38.8 gpm/ft.

- Well #2 was last redeveloped by S. B. Church in May 2019. A new Franklin Electric 30 horsepower six-inch diameter, 460-volt, 3 phase motor, and a Goulds model 7WALC submersible pump was installed with a pumping rate of approximately 210 gpm at 420 feet of TDH.

- Well #3 was last redeveloped by S. B. Church in June 2019. Note that this well was previously relined in 2006 from a 16-inch diameter well to an 8-inch diameter, 0.045-slot telescoping screen with a packer for the 12-inch diameter inner casing. The screen and packer length is 21.5 feet. The well was cleaned and redeveloped and the turbine pump and motor were replaced. The current pump setting is 71.2 feet, the depth gage line is

[4] Rodgers, J., 1985, *Bedrock Geologic Map of Connecticut*, Connecticut Geological and Natural History Survey in Cooperation with the U.S. Geological Survey.

installed to 50.0 feet. The pump has a capacity of 600 gpm at 500 feet of TDH. Following redevelopment, the well had a specific capacity of approximately 55.9 gpm/ft.

- Well #4 was last redeveloped by S. B. Church in September 2018. The well was cleaned and redeveloped and the turbine pump and motor were replaced. The well depth was noted as being 65 feet from the pumphouse with 15 feet of 12-inch diameter screen from 43 to 58 feet, and 7 feet of 12-inch diameter pipe to 65 feet. The well is packed with No. 4 gravel. Following redevelopment, the well had a specific capacity of approximately 30.0 gpm/ft.

Table 3-1 presents details regarding the Willimantic River Wellfield wells. Production well logs, pump curves, and other documentation regarding the wells is presented in Appendix E.

Table 3-1
Summary of Willimantic River Wells

Well No.	Year Drilled	Well Diameter (in)	Depth (ft)	Screen Details	Gravel Pack	Pump Setting (ft)	Pump Type	Pump Capacity (gpm)	Previously Reported Safe Yield (mgd)
1	1970	30 x 16	77.0	56.5-77.0 feet, 0.065 slot	Yes, 6" gravel	71.1	100 HP LST	400	0.8090
2	1974	24 x 14	78.0	68.3-78.0 feet, 0.100 slot	Yes	58.8	30 HP SUB	210	0.3900
3	1958	24 x 8	80.3	58.8-80.3 feet, 0.045 slot	Yes	71.2	100 HP LST	600	0.7830
4	1998	20 x 12	65.0	43.0-58.0 feet, 0.080 slot	Yes, #4 gravel	56.3	100 HP LST	540	0.8060

Note: HF = High Flow, HP = Horsepower, LST = Line Shaft Turbine, SUB = Submersible

3.1 Pumping Tests

Pumping tests of the Willimantic River Wellfield include individual yield tests of each well and a few simultaneous pumping tests.

- Well # 3 (formerly MTS Well #3) Initial Yield Test, 1959: This well was installed by R. E. Chapman Company. The 2004 *Water Supply Plan* prepared by UConn indicates that the original yield testing for Well # 3 was conducted by the R. E. Chapman Company. Well #3 was pumped at 703 gpm during a 48-hour pumping test. Pumping test data are not available.

- Well #3 (formerly MTS Well #3) Pumping Test, 1964: Data in the report *Hydrogeologic Data for the Shetucket River Basin, Connecticut* prepared by the United States Geological Survey (USGS) indicates that a 24-hour pumping test of Well #3 (USGS identification Ms25) was conducted from 6:30 am on July 23, 1964 to 6:30 am on July 24, 1964. Antecedent conditions were not recorded, and it is not known if rainfall occurred during the pumping test. Well #3 was pumped at an average pumping rate of 418 gpm. Pumping test data are available for two nearby observation wells, with the maximum drawdown in Well #3 reported as 9 feet, representing a specific capacity of 46.44 gpm/ft. Water levels in the production well were not reported.

- MTS Well #2 and Well #3 (formerly MTS Well #3) Pumping Test, 1968: Frederick R. Harris Associates conducted a 72-hour pumping test of Well #3 in 1968. Well #3 was pumped at 500 gpm for 45 hours beginning on May 8, 1968. Following this initial testing, the yield of Well #3 was increased to 725 gpm and MTS Well #2 was activated at a pumping rate of 500 gpm. The combined test was run for approximately 304.33 hours or 12.7 days. Antecedent conditions were not recorded, and it is not known if rainfall occurred during the pumping test. Pumping test data are available for the production wells and seven observation wells. Drawdown stabilized in Well #3 in the first part of the test at 14.0 feet, representing a specific capacity of 35.71 gpm/ft. Drawdown also stabilized in Well #3 during the second part of the test at 25.0 feet, representing a specific capacity of 29.00 gpm/ft. Drawdown in MTS Well #2 likely stabilized despite this not being reflected in the data due to the measurement method used[5], with the final drawdown of 18.5 feet representing a specific capacity of 27.03 gpm/ft. The static water level in both wells was recorded as 23.0 feet.

- Well #1 Initial Yield Test with Well #3 (formerly MTS Well #3), 1970: Well #1 was installed by the Able Drillers and Pump Company under the direction of Frederic R. Harris, Inc. Beginning September 7, 1970, Well #3 was pumped at a constant rate of 500 gpm for approximately three days to stabilize water levels in the wellfield and provide a near equilibrium conditions prior to the commencement of pumping of Well #1. This allowed for Well #1 to be pumped without consideration of interference from Well #3. Well #1 was activated on September 10, 1970 at 2:25 pm and was pumped at a rate of 750 gpm for approximately 188.5 hours until September 18, 1970 at 11:00 am. The combined pumping rate was 1,250 gpm. Antecedent conditions were not recorded on the pumping test sheet and it is not known if rainfall occurred during the pumping test. The static water level was not recorded. Pumping test data are not available. End of test drawdowns in observation wells are available. Based on this pumping test, Frederic R. Harris, Inc. estimated the future safe yield of the Willimantic River Wellfield (with additional wells that ultimately were never built) to be 2.7 mgd.

- Well #2 Initial Yield Test, 1974: This well was installed by R. E. Chapman Company. The initial yield test for Well #2 was conducted in February 1974 at a pumping rate of 361 gpm for 48-hours. The drawdown in the well was recorded as 40.5 feet, representing a specific capacity of 8.9 gpm/ft. The static water level was 3.0 feet. Note that the original depth of the well was 67.5 feet, and according to S. B. Church, after mounding for flood protection the depth was 80.5 feet, an increase of 13.0 feet. Thus, in terms of the current well construction, the static water level was 16.0 feet and the final water level was 56.5 feet. Antecedent conditions were not recorded on the pumping test sheet and it is not known if rainfall occurred during the pumping test. Pumping test data are not available.

- Well #2 Redevelopment, 1993-1994: Well #2 was redeveloped by R. E. Chapman Company in 1993-1994. After the redevelopment, the well was rated at 210 gpm with 23.0 feet of drawdown representing a specific capacity of 9.1 gpm/ft at 520 feet of TDH.

- Well #4 Initial Yield Test, 1999: A 98.3-hour pumping test of Well #4 was conducted by Lenard Engineering, Inc. from August 19, 1999 at 8:15 am to August 23, 1999 at 10:40 am. Antecedent conditions were dry with 0.75 inches of rainfall and 0.40 inches of rainfall measured on the mornings of August 14 and August 15, respectively. No rain fell during the four days immediately prior to the testing period. During the pumping test, 0.17 inches of rain was recorded the morning of August 21 and 0.05 inches was recorded on the morning of August 22. The other production wells at the wellfield were offline as of August 16, 1999. Well #4 was activated at an average pumping rate of 348.0 gpm through August 20, 1999 at 4:50 pm, when the pumping

[5] Production well drawdown was measured in six-inch increments. After 12 days of pumping, it is likely that MTS Well #2 was stable although this is not reflected in the data due to rounding of each measurement to the nearest six inches.

rate was increased to 489.6 gpm for the remainder of the test. Water was pumped to waste. Pumping test data are available, and drawdown in Well #4 was stable at the end of the pumping test. The static water level was 19.7 feet. The pumping level at the end of the test was 40.4 feet for a drawdown of 20.7 feet, representing a specific capacity of 23.56 gpm/ft.

- Well #1, Well #3, and Well #4 Simultaneous Pumping Test, 1999: Immediately following the test listed above, Well #1 and Well #3 were activated for a five day (121.5-hour) pumping test ending on August 28, 1999 at 12:00 pm. The only precipitation occurring during this test was recorded on the morning of August 26 (0.04 inches) and August 27 (0.10 inches). Well #2 was offline during this test. Well #1 was pumped at an average rate of 286.6 gpm, Well #3 was pumped at an average rate of 281.8 gpm, and Well #4 was throttled down to pump at an average rate of 414.0 gpm. Pumping test data are available. Well #1 and Well #3 were pumped into the distribution system, while Well #4 continued to be pumped to waste. The following results were noted for each production well:

    - Water levels were slowly declining at Well #1 in response to the Well #4 Initial Yield Test. The static water level on August 23, 1999 was 21.9 feet. Drawdown in Well #1 did not stabilize over the last 12 hours of pumping. The pumping rate of 286.6 gpm resulted in a drawdown of 12.0 feet, for a specific capacity of 23.88 gpm/ft.

    - Water levels were slowly declining at Well #2 in response to the Well #4 Initial Yield Test. The static water level on August 23, 1999 was 20.6 feet. Drawdown in Well #2 was 4.7 feet and the drawdown stabilized over the last 12 hours of pumping.

    - Water levels were slowly declining at Well #3 in response to the Well #4 Initial Yield Test. The static water level on August 23, 1999 was 3.8 feet. Drawdown in Well #3 stabilized over the last 12 hours of pumping. The pumping rate of 281.1 gpm resulted in a drawdown of 13.0 feet, for a specific capacity of 21.62 gpm/ft.

    - Water levels were stable at Well #4 in response to the Well #4 Initial Yield Test. Drawdown in Well #4 stabilized over the last 12 hours of pumping. The pumping rate of 414.0 gpm resulted in a drawdown of 24.1 feet, for a specific capacity of 17.18 gpm/ft.

- Willimantic River Study Pumping Tests, 2008-2009: Three informal pumping tests were conducted by UConn to generate data for analysis and numerical modeling as part of the Willimantic River Study, with observation wells and piezometers monitored by Milone & MacBroom, Inc. Water was directed into the distribution system during each test. Pumping test data are available, but drawdown is not available in the production wells, as the goal for each test was to monitor observation wells, riverbed piezometers, and river discharge changes.

    - The first pumping test was conducted between August 18, 2008 and August 21, 2008. The four production wells were pumped at an average of 1.50 mgd. Well #1 was pumped at approximately 366 gpm, Well #2 was pumped at approximately 96 gpm, Well #3 was pumped at approximately 371 gpm, and Well #4 was pumped at approximately 210 gpm.

    - The second pumping test was conducted between September 21, 2009 and September 24, 2009. The four production wells were pumped at an average of 1.81 mgd. Well #1 was pumped at approximately 435 gpm, Well #2 was pumped at approximately 158 gpm, Well #3 was pumped at approximately 427 gpm, and Well #4 was pumped at approximately 244 gpm.

- The third pumping test was conducted between November 9, 2009 and November 12, 2009. The four production wells were pumped at an average of 1.97 mgd. Well #1 was pumped at approximately 462 gpm, Well #2 was pumped at approximately 179 gpm, Well #3 was pumped at approximately 467 gpm, and Well #4 was pumped at approximately 259 gpm.

- Willimantic River Wellfield Step Tests, 2019: Independent step-drawdown tests of Well #2 and Well #3 were conducted on May 1, 2019 by S. B. Church. Water was pumped into the distribution system.

    - Well #2 was pumped at 150 gpm, 225 gpm, and 260 gpm. The reported specific capacity at each step was 10.86 gpm/ft, 10.97 gpm/ft, and 10.15 gpm/ft.

    - Well #3 was pumped at 264 gpm, 368 gpm, 422 gpm, 550 gpm, and 616 gpm, representing specific yields of 51.76 gpm/ft, 54.11 gpm/ft, 54.66 gpm/ft, 55.61 gpm/ft, and 55.69 gpm/ft, respectively.

The constant rate pumping test data above are summarized in the following table.

Table 3-2
Summary of Pumping Test Data at Willimantic River Wells

Well No.	Test Year	Test Length (hr)	Pumping Test Rate (gpm)	Static Water Level (ft)	Stabilized?	Drawdown (ft)	Final Water Level (ft)	Specific Capacity (gpm/ft)
3	1959	48	703.0	Unknown	Unknown	Unknown	Unknown	Unknown
3	1964	24	418.0	Unknown	Unknown	9.0	Unknown	46.44
3	1968	45	500.0	23.0	Yes	14.0	37.0	35.71
3 & MTS 2*	1968	304.3	Well #3 - 725.0 MTS #2 - 500.0	23.0 23.0	Yes Yes	25.0 18.5	48.0 41.5	29.00 27.03
1	1970	188.5	750.0	Unknown	Unknown	Unknown	Unknown	Unknown
2	**1974**	**48**	**361.0**	**16.0**	**Assumed**	**40.5**	**56.5**	**8.90**
4	1999	98.3	489.6	19.7	Yes	20.7	40.4	23.56
1, 3, 4	**1999**	**121.5**	**Well #1 - 286.6** **Well #3 - 281.8** **Well #4 - 414.0**	**21.9** **3.8** **19.7**	**No** **Yes** **Yes**	**12.0** **13.0** **24.1**	**33.9** **16.8** **43.8**	**23.88** **21.62** **17.18**
All	2008	72	1,043.0	Unknown	Unknown	Unknown	Unknown	Unknown
All	2009	72	1,264.0	Unknown	Unknown	Unknown	Unknown	Unknown
All	2009	72	1,367.0	Unknown	Unknown	Unknown	Unknown	Unknown

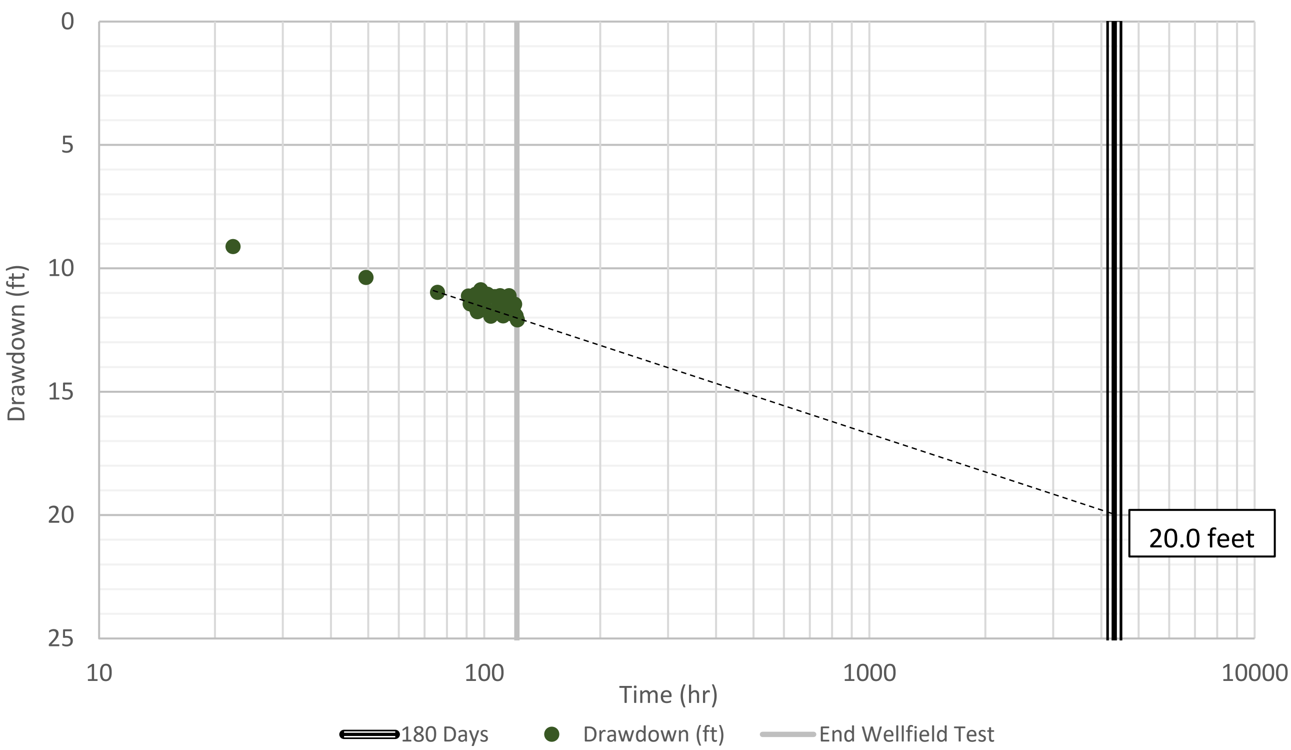
*Pump test of MTS Well #2 in essentially the same location as Well #4.
Note: Pumping tests used for the safe yield analysis are in **bold** text.

Based on the above discussions, while simultaneous pumping tests of all four production wells exist for the Willimantic River Wellfield, production well water level data is not available for these simultaneous tests. Furthermore, sufficient information is not available from many of the individual well tests (even if they were sufficient for other purposes such as initial or confirmatory yield testing) to evaluate interference effects. Thus, a combination of pumping tests will be necessary to evaluate safe yield. Note the following:

- Based on data from the 1968 combined pumping test, interference effects are likely at Well #1 and Well #2 from pumping of Well #3 and Well #4. Although data is not directly available to support this assertion, it is likely that the reverse is also true. Therefore, it is assumed that each production well interferes with the remaining production wells at the wellfield.

- The 1999 simultaneous pumping test of Well #1, Well #3, and Well #4 provides the best basis from which to conduct the safe yield analysis, as mutual interference is already present between each of the pumping wells, and the test provides interference effects of the pumping wells at the location of Well #2. Drawdown did not stabilize in Well #1 during this test. Therefore, this data must be extrapolated to represent a stabilized drawdown condition. Figure 3-1 presents the extrapolation which results in a drawdown of 20.0 feet for Well #1 when pumping at 286.6 gpm.

Figure 3-1
Drawdown Vs. Time Plot for Well #1 During 1999 Simultaneous Pumping Test



- No pumping test water level data is available within Well #2. However, the 1974 test was sufficiently long (48 hours) that the well was likely approaching stabilization (if not meeting stabilization) at a water level of 56.5 feet. Furthermore, we know from the 2008 and 2009 pumping tests that the wellfield can produce 1,367 gpm, with at least 179 gpm coming from Well #2. Finally, we know that pumping the other three wells interfered with Well #2 by 4.7 feet during the 1999 simultaneous pumping test. Thus, for the purpose of this analysis we assume that the 1974 test was stabilized, but to be conservative we assume that the 1974 pumping test rate is the maximum the well could theoretically produce. Therefore, no additional drawdown (only potential reductions in maximum theoretical yield) will be considered for Well #2.

- Finally, the pumping test data predate the current well characteristics for Well #3 (namely, the screen was reduced to eight inches in diameter in 2006). However, this will be accounted for by meeting the DPH guidance requirement for screen entrance velocity.

Data associated with each of these tests is included in Appendix E.

3.2 Maximum Additional Drawdown Available

Based on the individual yield tests above, the maximum additional available drawdown in the Four Willimantic River Wellfield wells has been calculated. Note that these pump depths and water levels are from the current mounded grades:

Table 3-3
Maximum Additional Available Drawdown Calculation

Well No.	Pump Depth (ft)		Stabilized Water Level (ft)		Safety Factor (ft)		Maximum Additional Available Drawdown (ft)
1	71.1	-	20.0	-	5.0	=	46.1
2	58.8	-	56.5	-	5.0	=	-2.7
3	71.2	-	13.0	-	5.0	=	53.2
4	56.3	-	24.1	-	5.0	=	27.2

The maximum additional available drawdown for Well #1, Well #3, and Well #4 is positive, indicating that the tested yield may be too low relative to theoretical safe yield when the pump setting and safety factors are considered. This makes sense given that the 1999 simultaneous pumping test rates for Well #1 and Well #3 were much lower than historical rates. The maximum theoretical pumping rate will be calculated later in this analysis to correct for the additional available drawdown. The maximum additional available drawdown for Well #2 is negative, likely due to the inclusion of the 5-foot safety factor.

3.3 Interference Effects

As noted in Section 3.1, several pumping tests include monitoring of water levels at observation wells. Note the following:

- The 1964 pumping test of MTS Well #3 (Well #3) at 418 gpm for 24 hours resulted in a drawdown of 3.1 feet at a distance of 140 feet from the pumping well and 0.9 feet at a distance of 210 feet from the pumping well. However, the test duration was short and it is not known if water levels stabilized.

- The 1968 pumping test of MTS Well #3 (Well #3) at 500 gpm for 45 hours resulted in the following drawdowns, with distances referenced to Well #3:

    - B-8 had a drawdown of 3.3 feet at a distance of 445 feet to the north-northwest. This is approximately 100 feet east of the eventual location of Well #2.
    - B-11 had a drawdown of 3.0 feet at an estimated distance of 560 feet to the north. This is believed to be near the eventual location of Well #1.
    - MTS Well #2 had a drawdown of 9.5 feet at a distance of 260 feet to the south.

  - MTS Well #3 had a stabilized drawdown of 14.0 feet.

- The 1968 simultaneous pumping test of MTS Well #3 (Well #3) at 725 gpm and MTS Well #2 at 500 gpm for 304.3 hours resulted in the following drawdowns:

  - B-8 had a drawdown of 8.6 feet approximately 100 feet east of the eventual location of Well #2.
  - B-11 had a drawdown of 7.6 feet near the eventual location of Well #1.
  - MTS Well #2 had a stabilized drawdown of 18.0 feet.
  - MTS Well #3 had a stabilized drawdown of 25.0 feet.

- The 1970 pumping test of Well #1 at 750 gpm for 188.5 hours resulted in the following drawdowns:

  - P-1 had a drawdown of 13.6 feet at a distance of 100 feet to the northeast.
  - P-2 had a drawdown of 14.3 feet at a distance of 45 feet to the northeast.
  - P-3 had a drawdown of 15.2 feet at a distance of 25 feet to the northeast.
  - P-4 had a drawdown of 13.0 feet at a distance of 100 feet to the southeast.
  - P-5 had a drawdown of 13.7 feet at a distance of 50 feet to the southeast.
  - P-6 had a drawdown of 14.6 feet at a distance of 25 feet to the southeast.
  - P-7 had a drawdown of 11.3 feet at a distance of 100 feet to the southwest.
  - P-8 had a drawdown of 13.9 feet at a distance of 45 feet to the southwest.
  - P-9 had a drawdown of 14.5 feet at a distance of 25 feet to the southwest.
  - P-10 had a drawdown of 11.1 feet at a distance of 90 feet to the northwest.
  - P-11 had a drawdown of 14.0 feet at a distance of 50 feet to the northwest.
  - P-12 had a drawdown of 14.5 feet at a distance of 25 feet to the northwest.

  Figure 3-2 presents the distance drawdown plot for the above data in order to estimate drawdowns at the remaining production wells. These include drawdowns of 5.7 feet for Well #2, 2.0 feet for Well #3, and 0.5 feet for Well #4 based on a curved line of best-fit through the data that represents the cone of depression originating from Well #1.

- The 1999 pumping test of Well #4 at 489.6 gpm for 98.3 hours resulted in the following drawdowns:

  - Well #1 had a drawdown of 0.5 feet at a distance of 820 feet to the north.
  - Well #2 had a drawdown of 0.4 feet at a distance of 715 feet to the east-northwest.
  - Well #3 had a drawdown of 1.6 feet at a distance of 270 feet to the north.

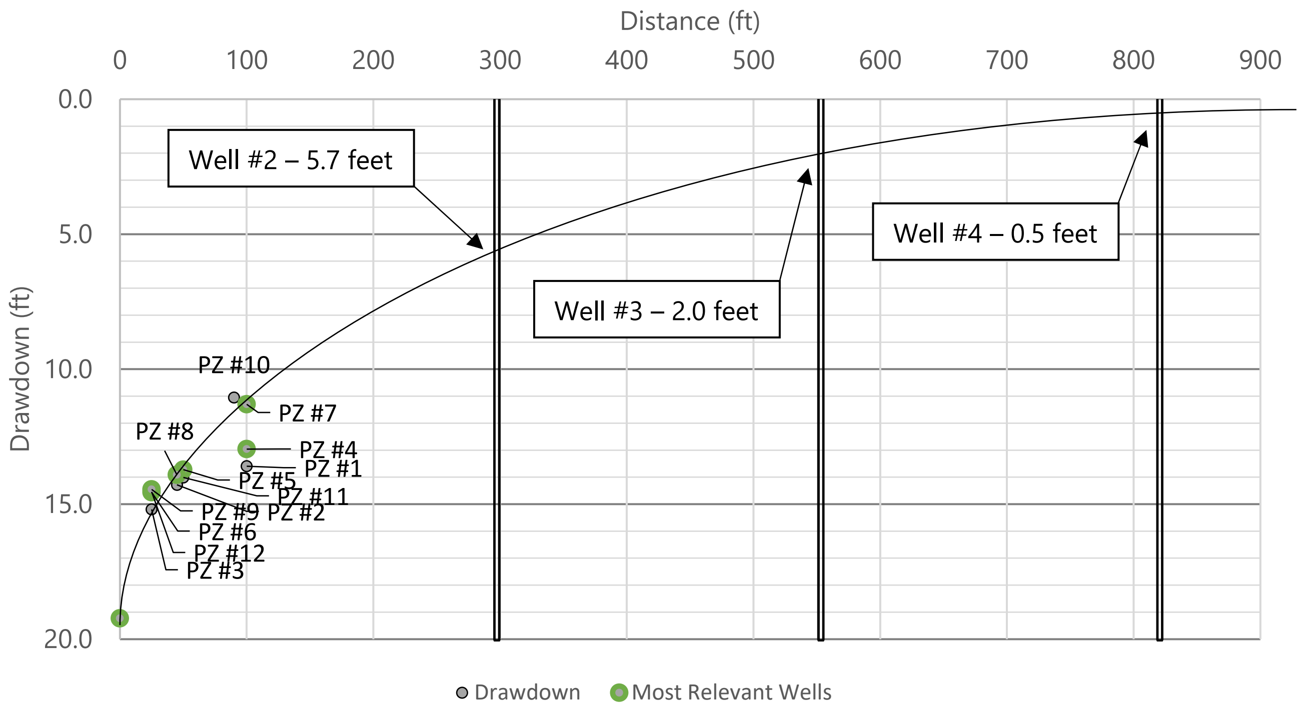
Note that the 1999 simultaneous pumping test rates are less than those for many of the individual tests noted above. Therefore, while "initial" mutual interference effects between the production wells are inherent in the 1999 pumping test data, additional interference between the production wells will occur as pumping rates increase above the tested rates. The interference between the four production wells has been estimated based on the available pumping test rates and drawdowns assuming a linear relationship based on the inverse of specific capacity. A summary of the interference effects calculated at each well is presented below:

- Well #1 is affected by interference from:

  - Well #3: Based on the 1968 pumping test, interference is 3.0 feet when Well #3 is pumping at 500.0 gpm, or by 0.006 feet/gpm.

- o Well #3 and MTS Well #2 (Well #4): Based on the 1968 simultaneous pumping test, interference is 7.6 feet when Well #3 is pumping at 725 gpm and MTS Well #2 (Well #4) is pumping at 500 gpm. Based on the 1999 pumping test (below), the interference due to pumping of MTS Well #2 was likely 0.5 feet, with 7.1 feet attributable to Well #3. This is equivalent to 0.010 feet/gpm for Well #3.

Figure 3-2
Distance-Drawdown Plot From Well 1: 9/10 - 9/18/1970



- o Well #4: Based on the 1999 pumping test, interference is 0.5 feet when Well #4 is pumping at 489.6 gpm, or by 0.001 feet/gpm.

- Well #2 is affected by interference from:

  - o Well #3: Based on the 1968 pumping test, interference is 3.3 feet when Well #3 is pumping at 500.0 gpm, or by 0.007 feet/gpm.

  - o Well #3 and MTS Well #2 (Well #4): Based on the 1968 simultaneous pumping test, interference is 8.6 feet when Well #3 is pumping at 725 gpm and MTS Well #2 (Well #4) is pumping at 500 gpm. Based on the 1999 pumping test (below), the interference due to pumping of MTS Well #2 was likely 0.4 feet, with 8.2 feet attributable to Well #3. This is equivalent to 0.011 feet/gpm for Well #3.

  - o Well #1: Based on the 1970 pumping test, interference is 5.7 feet when Well #1 is pumping at 750 gpm, or 0.008 feet/gpm.

- Well #4: Based on the 1999 pumping test, interference is 0.4 feet when Well #4 is pumping at 489.6 gpm, or 0.001 feet/gpm.

- Well #1, Well #3, and Well #4: Based on the 1999 simultaneous pumping test, combined interference was 4.7 feet when Well #1 was pumping at 286.6 gpm, Well #3 was pumping at 281.8 gpm, and Well #4 was pumping at 414.0 gpm. Based on the ratios calculated above, the interference at Well #2 appears to be approximately 1.7 feet from Well #1, 2.7 feet from Well #3, and 0.3 feet from Well #4.

- Well #3 is affected by interference from:
  - Well #1: Based on the 1970 pumping test, interference is 2.0 feet when Well #1 is pumping at 750 gpm, or 0.003 feet/gpm.
  - Well #4: Based on the 1999 pumping test, interference is 1.6 feet when Well #4 is pumping at 489.6 gpm, or 0.003 feet/gpm.

- Well #4 is affected by interference from:
  - Well #1: Based on the 1970 pumping test, interference is 0.5 feet when Well #1 is pumping at 750 gpm, or 0.001 feet/gpm.
  - Well #3: Based on the 1968 pumping test, interference is 9.5 feet when Well #3 is pumping at 500.0 gpm, or 0.019 feet/gpm.

Using the highest inverse specific capacity figures of 0.008 feet/gpm for Well #1, 0.011 feet/gpm for Well #3, and 0.001 feet/gpm for Well #4, the estimated interference from Well #2 pumping at 361 gpm would be 2.9 feet at Well #1, 4.0 feet at Well #3, and 0.4 feet at Well #4. The above interference calculations are used in the next section to evaluate additional interference from the additional available drawdown.

3.4 Additional Available Drawdown after Accounting for Interference Effects

The calculated "initial" interference effects at each well were subtracted from the maximum additional available drawdown to calculate "initial" additional available drawdown at each well as presented below. This is based on the 1999 simultaneous pumping test affecting Well #2, and the 1974 pumping test of Well #2 affecting the other three production wells.

Table 3-4
Initial Additional Available Drawdown Calculation

Well No.	Maximum Additional Available Drawdown (ft)		Initial Interference Effect (ft)		Initial Additional Available Drawdown (ft)
1	46.1	-	2.9	-	43.2
2	-2.7	-	4.7	-	-7.4
3	53.2	-	4.0	-	49.2
4	27.2	-	0.4	-	26.8

Additional interference effects are likely when the additional available drawdown is realized, because the cone of depression for each well will be larger. The additional interference effects at each well have been calculated based on the percentage of interference effects to the drawdown that occurred during each pumping test. The additional interference calculations are rounded up to be conservative.

Table 3-5
Additional Interference Calculation

Well No.	Initial Interference Effect (ft)		Test Drawdown (ft)		Percentage		Initial Additional Available Drawdown (ft)		Additional Interference (ft)
1	2.9	/	20.0	=	0.145	x	43.2	=	6.3
2	4.7	/	40.5	=	0.116	x	-7.4	=	0.9
3	4.0	/	13.0	=	0.308	x	49.2	=	15.2
4	0.4	/	24.1	=	0.017	x	26.8	=	0.5

The additional interference is then subtracted from the initial additional available drawdown to calculate the final additional available drawdown available in each well.

Table 3-6
Final Additional Available Drawdown Calculation

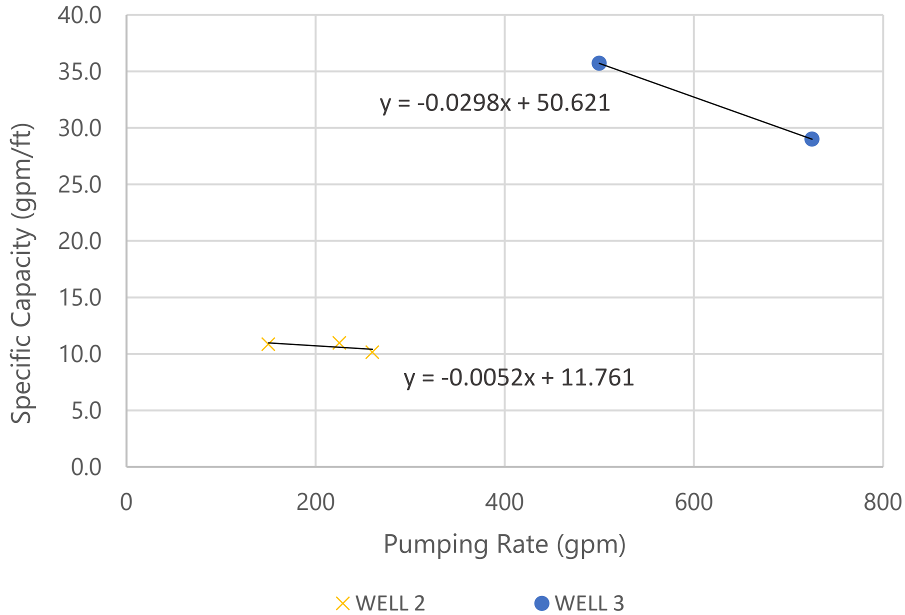
Well No.	Initial Additional Available Drawdown (ft)		Additional Interference (ft)		Final Additional Available Drawdown (ft)
1	43.2	-	6.3	=	36.9
2	-7.4	-	0.9	=	-8.3
3	49.2	-	15.2	=	34.0
4	26.8	-	0.5	=	26.3

3.5 Specific Capacity Reduction

Figure 3-3 presents specific capacities for each production well from known step test data. While two sets of step test data are available for Well #3, the 2019 data appears to indicate that specific capacity increases with increasing yield, while the 1968 data shows it as decreasing with increasing yield. The 1968 data is used herein as it is more conservative. The equations on the graph are used in the next section to correct the additional available yield of each production well from the final additional available drawdown.

Note that step test data does not appear to be available for Well #1 and Well #4. Therefore, a specific capacity reduction of 50% is applied to these wells to correct the additional available yield from the final additional available drawdown.

Figure 3-3
Specific Capacity Data



3.6 Theoretical Yield

The maximum theoretical yield for each well at the Willimantic River Wellfield was calculated using the pumping rates sustained during the 1974 (Well #2) and 1999 simultaneous (Well #1, Well #3, and Well #4) pumping tests, the final additional available drawdown calculated above, and the specific capacity reduction in Figure 3-3 where available. First, the initial additional available yield is calculated based on the specific capacity during the individual pumping tests, which is added to the pumping test rates to determine maximum theoretical yield for each production well.

Table 3-7
Initial Additional Available Yield Calculation

Well No.	Specific Capacity (gpm/ft)		Final Additional Available Drawdown (ft)		Initial Additional Available Yield (gpm)		Pumping Test Rate (gpm)		Maximum Theoretical Yield (gpm)
1	23.88	x	36.9	=	881.2	+	286.6	=	1,167.8
2	8.90	x	-8.3	=	-73.9	+	361.0	=	287.1
3	21.62	x	34.0	=	735.1	+	281.8	=	1,016.9
4	17.18	x	26.3	=	451.8	+	414.0	=	865.8

Based on the specific capacity equations for each production well in Figure 3-3 (or a 50% reduction), and the maximum theoretical yield for each well calculated above, the following reductions in specific capacity would occur when increasing the pumping rate to these theoretical yields:

- As step test data were not available for Well #1, the specific capacity reduction for increasing the yield at Well #1 is assumed to be 50%.

- Although step test data is available for Well #2, the well yield is projected to decrease from the tested yield. Thus, the specific capacity reduction is 0%.

- Based on the linear trendline for Well #3, the specific capacity at a yield of 1,017 gpm (20.31 gpm/ft) is 48% of the specific capacity at a yield of 282 gpm (42.22 gpm/ft). Thus, the specific capacity reduction for increasing the yield at Well #3 is 52%.

- As step test data were not available for Well #4, the specific capacity reduction for increasing the yield at Well #4 is assumed to be 50%.

The specific capacity reduction is applied to the initial additional available yield in order to determine the yield reduction due to the decrease in specific capacity from increasing the pumping rate of each production well. The resulting additional available yield is then added to the pumping test rate to determine the adjusted theoretical yield for each well.

Table 3-8
Yield Reduction Due to Specific Capacity Reduction

Well No.	Initial Additional Available Yield (gpm)		Specific Capacity Reduction		Yield Reduction (gpm)
1	881.2	x	0.50	=	440.6
2	-73.9	x	0.00	=	0.0
3	735.1	x	0.52	=	382.3
4	451.8	x	0.50	=	225.9

Table 3-9
Adjusted Theoretical Yield Calculation

Well No.	Initial Additional Available Yield (gpm)		Yield Reduction (gpm)		Additional Available Yield (gpm)		Pumping Test Rate (gpm)		Adjusted Theoretical Yield (gpm)	With 100% Increase Cap (gpm)
1	881.2	-	440.6	=	440.6	+	286.6	=	727.2	573.2
2	-73.9	-	0.0	=	-73.9	+	361.0	=	287.1	287.1
3	735.1	-	382.3	=	352.8	+	281.8	=	634.6	563.6
4	451.8	-	225.9	=	225.9	+	414.0	=	639.9	639.9
Total							**1,343.4**		**2,288.8**	**2,063.8**

Note that the DPH procedures restrict the increase in safe yield at no more than 100% for an individual well. While the adjusted theoretical yield for Well #4 is within the 100% limit, the adjusted theoretical yields for Well #1 and Well #3 exceed the 100% limit. Thus, the adjusted theoretical yield for Well #1 must be reduced to at most

573.2 gpm, and the adjusted theoretical yield for Well #3 must be reduced to at most 563.6 gpm due to this restriction. Additionally, note that Well #2 is capped at 287.1 gpm due to the reduction in safe yield.

Furthermore, the DPH procedures require that screen entrance velocity does not exceed 0.1 feet per second. The surface area of each well screen was calculated based on the equation for the surface area of a cylinder, A = 2*π*radius*height, which neglects the top and bottom of the cylinder:

- For Well #1, the area of the outer well screen is 12,365.3 square inches. Based on the "free flow" screen specification information from Johnson Well Screens (Appendix D), the screen in Well #1 has an intake area of approximately 182.5 in^2/ft or 3,741.3 square inches. Multiplying this by 0.1 ft/s, the flow would be 155.9 cubic feet per minute or 1,166.2 gpm.

- For Well #2, the area of the outer well screen is 5,119.5 square inches. Based on the "free flow" screen specification information from Johnson Well Screens (Appendix D), the screen in Well #2 has an intake area of approximately 213 in^2/ft or 2,066.1 square inches. Multiplying this by 0.1 ft/s, the flow would be 86.1 cubic feet per minute or 644.1 gpm.

- For Well #3, the area of the outer well screen is 6,152.5 square inches. Based on the "hi flow" screen specification information from Johnson Well Screens (Appendix D), the screen in Well #3 has an intake area of approximately 121 in^2/ft or 2,468.4 square inches. Multiplying this by 0.1 ft/s, the flow would be 102.9 cubic feet per minute or 769.4 gpm.

- For Well #4, the area of the outer well screen is 6,785.8 square inches. Based on the "hi flow" screen specification information from Johnson Well Screens (Appendix D), the screen in Well #4 has an intake area of approximately 256 in^2/ft or 3,840.0 square inches. Multiplying this by 0.1 ft/s, the flow would be 160.0 cubic feet per minute or 1,196.9 gpm.

Based on the above, none of the theoretical yields need to be capped due to screen entrance velocity.

Finally, the DPH procedures require that the maximum increase in theoretical yield for this wellfield must be capped at no more than 50% above the combined pumping test rates, or 2,015.1 gpm. As sum of the individual yields with the 100% individual increase restriction (2,063.8 gpm) are greater than the maximum 50% increase cap for the entire wellfield, the final theoretical yields for each well were proportionally reduced based on pumping rate.

Table 3-10
Capped Theoretical Yield Calculation

Well No.	Pumping Test Rate (gpm)	Adjusted Theoretical Yield (gpm)	With 100% Increase Cap (gpm)		Adjustment for 50% Wellfield Increase Cap (gpm)		Final Theoretical Yield (gpm)
1	286.6	727.2	573.2	-	13.5	=	559.7
2	361.0	287.1	287.1	-	6.8	=	280.3
3	281.8	634.6	563.6	-	13.3	=	550.3
4	414.0	639.9	639.9	-	15.1	=	624.8
Total	**1,343.4**	**2,288.8**	**2,063.8**	**-**	**48.7**	**=**	**2,015.1**

3.7 Critical Dry Period Adjustment

The final theoretical yield for each well at the Willimantic River Wellfield as calculated on the basis of the 1974 initial yield test of Well #2 and the 1999 simultaneous pumping test of Well #1, Well #3, and Well #4 was adjusted for the critical dry period by using the standard 75% multiplier representing an 18-hour pumping day. The additional 90% multiplier was not applicable because these wells are drilled into stratified drift. A summary table is presented below.

Table 3-11
Safe Yield Calculation for Willimantic River Wellfield

Well No.	Final Theoretical Yield (gpm)	Final Theoretical Yield (mgd)		18-Hour Pumping Day Multiplier		Bedrock Well Multiplier		Safe Yield (mgd)
1	559.7	0.8060	x	0.75	x	1.00	=	0.6045
2	280.3	0.4036	x	0.75	x	1.00	=	0.3027
3	550.3	0.7924	x	0.75	x	1.00	=	0.5943
4	624.8	0.8997	x	0.75	x	1.00	=	0.6748
Total for Willimantic River Wellfield								**2.1763**

The calculated safe yield for the Willimantic River Wellfield (Well #1, Well #2, Well #3, and Well #4) is **2.1763 mgd**. This is higher than the interim safe yield estimated in the 2011 *Water Supply Plan* (1.48 mgd) as it is partially based on extrapolation of historic pumping tests (with some pumping to waste) as opposed to directly using recent pumping test rates (pumping into the system). The combined safe yield is less than the combined diversion registration for the wellfield, with all four individual safe yields being less than the individual registration rates. Finally, the final theoretical yield for Well #2 is consistent with the recent step test pumping rates achieved by S. B. Church.

Note that the above analysis is limited by the relatively low pumping test rates during the 1999 pumping test for Well #1 and Well #3. It is likely that a greater safe yield could be realized during a simultaneous pumping test with all four wells running to waste. Furthermore, pumping capacity currently limits the available water below the safe yields listed above. If additional available water is needed in the future, UConn should consider conducting such a pumping test in association with planning for upgraded pumps that could produce at the safe yield pumping rates.

APPENDIX A

Regulations and Procedures for Calculation of Safe Yield

Agency
Department of Public Health

Subject
Source Water Protection Measures

Inclusive Sections
§§ 25-32d-1—25-32d-6

CONTENTS

Source Water Protection Measures

Sec. 25-32d-1. Repealed

Repealed August 10, 2000.

Sec. 25-32d-1a. Definitions

(a) As used in sections 25-32d-1a to 25-32d-6, inclusive, of the Regulations of Connecticut State Agencies:

(1) "1 in 100 occurrence frequency" means the 1 in 100 year recurrence interval for the critical dry period or the one percent non-exceedance probability for the critical drawdown duration;

(2) "Active source" means a department approved source of supply which meets state and federal water quality standards, with adequate department approved treatment facilities as needed, or for which compliance schedules are in place. An active source is one that is permanently connected to the system and may include, but need not be limited to, a seasonal or standby source of supply that may be used intermittently or on a partial year basis;

(3) "Adequate water supply" means a quantity of water sufficient to meet demands even in a critical dry period;

(4) "Available water" means the maximum amount of water a company can dependably supply, taking into account the following reductions applied to safe yield: any limitations imposed by hydraulics, treatment, well pump capabilities, reductions of well yield due to clogging that can be corrected with redevelopment, transmission mains, permit conditions, source construction limitations, approval limitations, or operational considerations; and the safe yield of active sources and water supplied according to contract, provided that the contract is not subject to cancellation or suspension and assures the availability of water throughout a period of drought and that the supply is reliable;

(5) "Average daily demand" means the total annual production from all sources of supply divided by the number of days in that calendar year;

(6) "Commissioner" means the Commissioner of Public Health or his designated representative;

(7) "Complete plan" means a plan that satisfies the content requirements of sections 25-32d-2 to 25-32d-4, inclusive, of the Regulations of Connecticut State Agencies and that is technically adequate for its intended purpose;

(8) "Conservation" or "water conservation" means measures designed to promote efficient use of water and to eliminate waste of water;

(9) "Consumptive losses" means any water uses which do not result in the water being discharged back into the water source at or near the withdrawal point in substantially the same quality and quantity as prior to use;

(10) "Contaminant" means any physical, chemical, biological, or radiological substance or matter in water.

(11) "Critical drawdown duration" means the length of time for a reservoir to go from full to the bottom of usable storage for single-year cycle reservoirs, and from full to the

bottom of usable storage without spilling in the intervening period for multi-year cycle reservoirs;

(12) "Critical dry period" means the historic drought event for which yield is the least. For surface water sources of supply the critical dry period has both a critical drawdown duration and a 1 in 100 occurrence frequency. For ground water sources of supply the critical dry period is the 180 day pumping event with no precipitation recharge and a seven day duration and a one in ten year recurrence frequency of the stream flow;

(13) "Critical Lands to be protected" means any land located within a source water protection area;

(14) "Critical system component" means any water system component or facility necessary to deliver, with at least twenty-five pounds per square inch of pressure, one hundred percent of the average daily demand of the system or any portion of the system that it serves;

(15) "Demand management" means conservation measures which provide assistance for consumers to use water economically and efficiently and that may achieve permanent water savings;

(16) "Department" means the Department of Public Health or its designated representative;

(17) "Emergency source" means a source of supply identified by the water company within its water supply emergency contingency plan for possible use at various stages of an emergency. An emergency source is not an active source and is not considered part of available water. An emergency source may be prohibited from use as a source of supply due to contractual limitations, lack of water quality monitoring, known or suspected water quality limitations, the need for additional treatment prior to use, or the absence of any required state and local approval;

(18) "Flashboards" means temporary or semi-permanent structures across the spillway of a reservoir. Flashboards increase water levels and storage volumes that are designed to be released during flood events;

(19) "Inactive source" means a source of supply that is not used or maintained as an active or emergency source of supply, but has not been abandoned in accordance with Section 25-33k of the Connecticut General Statutes, is not routinely monitored, and is physically disconnected from the system;

(20) "Initial plan" means the first plan for a water company ever requested by the commissioner pursuant to section 25-32d of the Connecticut General Statutes;

(21) "Major users" means the ten water customers with the greatest annual volumes of water use for the most recent calendar year and all other users with individual meters or estimated use exceeding an annual average of 50,000 gallons of water per day based on the most recent calendar year;

(22) "Margin of safety" means the unitless ratio of available water to demand;

(23) "Mass balance methodology" means a technique based on the continuity equation, in which the sum of all water inflows minus the sum of all water outflows is equal to the

change in storage. Inflows include streamflow, direct precipitation, diversions, routing from upstream reservoirs, ground water discharge, and supplementation from wells. Outflows include water supply withdrawals, streamflow releases, evaporation, diversions, consumptive losses, groundwater recharge, uncontrolled releases downstream orspills from the reservoir, and dam leakage;

(24) "Maximum month demand" means the highest water demand in a month calculated by dividing the total production from all sources of supply for each calendar month by the number of days in that month and expressed in gallons per day;

(25) "Minimum stream flow releases" means water released from a reservoir for the purpose of providing a specified flow rate downstream of a dam. The flow requirements may be fixed or variable;

(26) "Modified plan" means any amendments, modifications or page revisions to an initial or revised plan as requested by the commissioner or submitted by a water company in order to satisfy the requirements for completeness or plan approval;

(27) "Non-revenue water" means the difference between total annual metered water production and the sum of annual metered water consumption plus any other properly estimated revenue-producing unmetered water;

(28) "Peak day demand" means the annual maximum daily rate of water use measured in gallons per day;

(29) "Planning periods" means time periods for projecting future demands for planning to meet future water supply needs. Planning periods are five years from the time of plan preparation and twenty years (20) and fifty (50) years from the last decennial census;

(30) "Public or privately-owned protected lands" means any combination of state forest, parklands and municipally or privately held land, excluding water company-owned lands, designated as protected open space in a delineated source water protection area;

(31) "Regional planning organization" means regional planning agencies created pursuant to the provisions of sections 8-31a to 8-37b, inclusive, of the Connecticut General Statutes, regional councils of elected officials created pursuant to the provisions of sections 4-124c to 4-124h, inclusive, of the Connecticut General Statutes, where such councils have undertaken to exercise the powers of regional planning agencies and regional councils of governments created pursuant to the provisions of sections 4-124i to 4-124p, inclusive, of the Connecticut General Statutes;

(32) "Revised plan" means any subsequent plan requested by the commissioner or submitted by a water company pursuant to section 25-32d of the Connecticut General Statutes after the initial plan and excluding modified plans;

(33) "Safe yield" means the maximum dependable quantity of water per unit of time which may flow or be pumped continuously from a source of supply during a critical dry period without consideration of available water limitations;

(34) "Source of supply" means any well, spring, reservoir, stream, river or other location where water is siphoned, pumped, channeled, or withdrawn for water supply purposes, including interconnections with other water companies;

(35) "Source water assessment program" (SWAP) means a program adopted by the State to evaluate the susceptibility of public water supply sources to potential sources of contamination, pursuant to the federal Safe Drinking Water Act (SDWA) Amendments of 1996, 42 U.S.C. Section 300j-13;

(36) "Source Water Assessment Program Work Plan" means the strategy plan prepared by the Department of Public Health to implement the provisions of the Source Water Assessment Program.

(37) "Source Water Assessment Report" means the official document created by the Department of Public Health pursuant to the Safe Drinking Water Act (SDWA) Amendments of 1996, 42 U.S.C. Section 300j-13;

(38) "Source water protection area" means an area of land delineated by the state Source Water Assessment Program (SWAP), and identified in the Connecticut Source Water Assessment Program Work Plan, that contributes water to any public water supply source where significant potential contaminant sources (SPCS) are identified, evaluated, and inventoried in order to protect the purity of any public water supply source;

(39) "Stabilization" means a condition measured during a pumping test when no more than a total of 0.25 feet of drawdown occurs over the last twelve hours prior to completion of the test or, where drawdown cannot be determined to that accuracy due to equipment inadequacy, no more than a total of 1.0 foot;

(40) "State agency" means the Department of Public Health, the Department of Environmental Protection, the Department of Public Utility Control, or the Office of Policy and Management, as applicable;

(41) "Supply deficient" means a supply of available water insufficient to meet average daily demand, maximum month demand, or peak day demand;

(42) "Supply management" means conservation measures which improve the efficiency of and eliminate waste in the production and distribution of water within a system;

(43) "Usable storage" means the difference between total storage volume of a water supply reservoir and the remaining volume below the minimum operational level, intake pipe elevation, or water elevation above which water can be treated to meet water quality standards, whichever is least;

(44) "User category" means metered residential, metered commercial, metered industrial, metered public authorities, unmetered residential, unmetered commercial, unmetered industrial, unmetered public authorities, and non-revenue water. Residential includes apartments and condominiums;

(45) "Water company" or "company" means a water company as defined in Section 25-32a of the Connecticut General Statutes;

(46) "Water supply emergency contingency plan" means response procedures and preparations for water supply emergencies due to contamination, power outages, drought, flood or failure of any or all critical system components by natural or manmade events;

(47) "Water supply emergency" means any event that may adversely impact the quality or quantity of potable water supplies such that it may not be sufficient to serve customers

in accordance with the provisions of the Public Health Code;

(48) "Water supply system" means any combination of interconnected sources and facilities for the purposes of supplying potable water which are owned and operated by the same water company; and

((49))

(Adopted effective August 10, 2000; Amended August 3, 2006)

Sec. 25-32d-2. Preparation of plans and schedule for submission

(a) Each water company supplying water to 1,000 or more persons or 250 or more consumers, and any other water company requested by the commissioner, shall submit a water supply plan for approval in conformance with Sections 25-32d-1a through 25-32d-6, inclusive, of the Regulations of Connecticut State Agencies.

(b) If the commissioner requests a water company to submit an initial plan, the water company shall submit the plan within two years from the date of the request.

(c) If the commissioner requests a water company to submit a revised plan, the water company shall submit the plan within one year from the date of the request.

(d) In preparing the plan, the water company shall:

(1) Provide a separate analysis for each water supply system;

(2) use gallons as a unit of measure; and

(3) use the most current national geodetic vertical datum from the National Geodetic Survey, unless otherwise specified.

(Adopted effective August 10, 2000)

Sec. 25-32d-3. Contents of the plan

Each water supply plan submitted shall evaluate the water supply needs in the service area of the water company and propose a strategy to meet such needs. The plan shall contain:

(a) A description of the existing water supply system, including:

(1) The legislative or franchise authority for the areas proposed to be served by the plan;

(2) a list and description of: service areas; sources of supply, including active, emergency and inactive sources, with a description of what portion of the service area is served by each source of supply; pump stations; and storage and treatment facilities;

(3) a map of: water company owned lands, service areas, sources of supply, interconnections, pumping stations, pressure zones, source water protection area boundaries, storage, treatment facilities, public or privately-owned protected lands.

(4) a map and description of existing transmission and distribution facilities, including age, materials, capacity and condition, if known;

(5) a description of meter reading and testing program and extent of metering;

(6) a schematic of the water supply system's hydraulic profile;

(7) a general discussion of the water supply system's fire flow capabilities;

(8) the calculation of the safe yield of each source of supply in accordance with Section 25-32d-4 of the Regulations of Connecticut State Agencies;

(9) a summary of monthly system production data by sources of supply and a summary of system average daily demands, maximum month demands and peak day demands for the previous five years;

(10) a list, description, and map of existing interconnections, and the quantities of water sold to or purchased from other water companies during the previous five years, and any limitations on their use;

(11) a history of water quality violations in each water supply system for the previous five years and a trend analysis for water quality parameters that may be approaching water quality standards;

(12) a description of the watershed inspection program required pursuant to subsection (b) of section 19-13-B102 of the Regulations of Connecticut State Agencies and the cross connection inspection program required pursuant to subsection (f) of section 19-13-B102 of the Regulations of Connecticut State Agencies, and demonstration of compliance with certification requirements pursuant to sections 25-32-7a to 25-32-14, inclusive, of the Regulations of Connecticut State Agencies;

(b) An analysis of present and future water supply demands for the five, twenty, and fifty year planning periods, including:

(1) A description of the present population distribution patterns and population served;

(2) data and an evaluation of current and historic water use in each water supply system for the past five years of record, or since the most recent submittal of a water supply plan, including average daily, maximum month and peak day demands and sales to other water companies. Water companies that have this data compiled by user categories shall provide data in that form;

(3) a description of local, state and regional land use plans, policies and zoning as related to projected water demands and future service areas;

(4) projected water demands for the five, twenty and fifty year planning periods, A 4 including sales to other water companies, based on user categories if data is available, and local land use plans and zoning regulations;

(5) an assessment of population changes within existing and future service areas for the five, twenty, and fifty year planning periods using the Office of Policy and Management's most current population data and projections, including an explanation of any deviations thereto and maps depicting the existing and future service areas;

(6) identification of any sources of supply that will no longer be used to meet system demands or any sources of supply to be abandoned;

(7) an analysis of the relationship between available water and average daily demand as determined for the most recent representative period of record not affected by unusual demand conditions such as drought or a significant temporary increase in demand, maximum month demand and peak day demand and the margin of safety to be maintained by the water company currently and for the five, twenty, and fifty year planning periods;

(8) demonstration that the margin of safety is sufficient to meet the water company's current and future needs considering factors such as potential increases or decreases in

demand, the time required to bring new sources of supply on line, potential losses of sources of supply or decreased capacities, land area available for development, available interconnections and other factors which may increase or reduce supply or demand;

(9) an analysis of any treatment limitations, water quality concerns, or distribution system limitations and the ability to meet demands currently and for the five, twenty and fifty year planning periods; and

(10) an analysis of any system improvements necessary to minimize the effect of a water supply emergency on critical system components as identified in subdivision (1) of subsection (d) of this section.

(c) An assessment of potential alternative sources of supply, including:

(1) An analysis of alternatives to allow the use of inactive or emergency sources of supply and the safe yield of existing active sources of supply beyond any current limitations in order to meet demands currently and in the five, twenty and fifty year planning periods;

(2) an evaluation of potential new sources of supply and a description of existing state, local and regional land use plans, policies, classifications and zoning as they relate to source development;

(3) identification of potential or historic pollution sources which may affect any new source of supply; and

(4) a demonstration of the ability of the selected alternatives to meet future system demands, including a conceptual implementation plan.

(d) A water supply emergency contingency plan, including emergencies due to contamination of water, power outages, drought, flood or failure of any or all-critical system components. Such water supply emergency contingency plan shall include:

(1) A list identifying critical system components and potential water supply emergencies that may affect them including contamination, power outages, drought, flood or failure, but excluding routine events, such as water main breaks and inoperable valves;

(2) A list identifying significant user groups in commercial, industrial, municipal and residential categories, and discussions of mechanisms of direct technical assistance to these significant quantity user groups.

(3) a description of the level of service to be sustained during water supply emergencies, including identification of priority users, procedures for public notification of priority users, and the means for provision of essential potable water to priority users where priority is based on the potential risk to health, safety and welfare posed by the curtailment of service; and procedures for advance notice to users for which service may be suspended if rationing is required and for implementation of rationing and use bans;

(4) procedures for responding to toxic spills or hazardous materials that may contaminate a watershed or aquifer used for drinking water;

(5) an inventory of equipment needs and availability, including location of existing emergency equipment, generators and spill response materials, identification of additional emergency equipment needs, and procedures for obtaining additional equipment or services;

(6) a list prioritizing emergency sources, including interconnections and independent

industrial and commercial water supplies within the service area, and describing contractual, technical and financial requirements for their use, a schedule for activation, available yield and known water quality problems or limitations;

(7) procedures for notification of local, state and federal officials and the public;

(8) a description of duties and responsibilities of key personnel involved in emergency response actions, and a procedure for contacting and scheduling staff;

(9) a description of local ordinances and municipal authority to implement water use restriction.

(10) a description of four stages of response during drought based emergencies, including identification of trigger levels which initiate each stage based on water supply availability and demand situation, reservoir storage levels, or critical operational indicators, including storage tank recovery, pumping capacity, or for groundwater dependent systems, the number of hours of continuous well pump operation. Additional trigger levels may include; precipitation, groundwater, stream flow, and reservoir levels, and also include, the Palmer Drought Severity Index, crop moisture index and fire danger index. The four stages of response shall include: a drought advisory, a drought watch, a drought warning, and a drought emergency. Triggers shall give sufficient lead time to adequately implement response actions. The plan shall include the following stages and actions unless otherwise approved by the department:

(A) a list of actions to be taken in a drought advisory, including contacting the department and affected municipalities, evaluation of emergency source options, schedule for obtaining emergency equipment, implementation of internal measures to maximize use of existing active sources, promotion of voluntary conservation in residential, commercial and industrial facilities to reduce demand by ten percent from previous non-drought average for the appropriate month, preparation for mandatory conservation including necessary enforcement mechanisms, activation of the budget process for funding necessary projects;

(B) a list of actions to be taken in a drought watch, including contacting the department, preparing emergency sources for use, implementation of voluntary conservation to reduce demand by an additional five percent for a total of fifteen percent from previous non-drought average for the appropriate month, coordination with local officials concerning alternative facilities for obtaining water, reevaluation of priority among users and those actions required under previous water supply emergency contingency plan stages;

(C) a list of actions to be taken in a drought warning, including contacting the department, activation of emergency sources upon department approval, institution of mandatory conservation to reduce demand by an additional five percent for a total of twenty percent from previous non-drought average for the appropriate month, initiation of weekly reporting of reservoir water supply status to the department and those actions required under previous water supply emergency contingency plan stages; and

(D) a list of actions to be taken in a drought emergency, including contacting the department, activation of emergency sources upon department approval, institution of the second phase of mandatory conservation to reduce demand by an additional five percent for a total of twenty-five percent from the previous non-drought average for the appropriate month, coordination with local officials for the provision of emergency services for bathing and obtaining drinking water for the highest priority users, enforcement of measures through local ordinances and state and municipal authorities and those actions required under previous water supply emergency contingency plan stages; and

(11) a signed statement by the water company's chief executive officer attesting to the existence of procedures for sabotage prevention and response. For security and safety reasons, procedures for sabotage prevention and response shall not be submitted for state agency review.

(e) Recommendations for new water system development or system improvements, including:

(1) A conceptual plan for improvements necessary to meet current and projected water demands for the planning periods, to serve current and future service areas, and to minimize the effect of a water supply emergency, limited to improvements for transmission, pumping, emergency power generation, storage and treatment to deliver water to the projected service areas;

(2) identification of improvements in subdivision (1) of this subsection which are anticipated to be implemented in the five year planning period and a proposed schedule for implementation; and

(3) a conceptual implementation plan for the items identified in subdivision (1) of this subsection for the twenty and fifty year planning periods.

(f) A forecast of future land sales that includes a list of the address, associated source of supply and acreage included for each anticipated parcel of land projected to be sold during the five, twenty and fifty year planning periods and other information required by section 25-32d(b)(6) of the Connecticut General Statutes;

(g) A plan for strategic ground water monitoring in conformance with the strategic groundwater monitoring plan required pursuant to section 22a-354aa of the Connecticut General Statutes; and

(h) An analysis of the impact of water conservation practices and a strategy for implementing supply and demand management measures, as follows:

(1) The water conservation plan shall be designed to meet the specific needs of the water supply system for which it is designed. In all cases the plan shall be designed to increase the efficiency of the system, reduce waste and encourage consumer water conservation efforts.

(2) Water conservation plans shall include both demand management and supply management measures and address short and long-term water conservation. The measures that will be implemented and the implementation schedule shall depend on the specific needs of the water supply system and its ability to meet current and future water system needs. There shall be detailed discussion of each water conservation measure which shall include the following:

(A) objective;

(B) assessment of current conditions including deficiencies, if any;

(C) activities and measures taken or to be taken to achieve or maintain the objectives; and

(D) procedures for implementation, including an identification of the groups and agencies which need to be involved.

(3) The demand management section of the water conservation plan shall be designed to reduce peak day demand or average daily demand or both, depending upon the condition of the system, and shall include at least the following information:

(A) goals and objectives for demand management;

(B) strategies to reduce maximum month and peak day demands;

(C) existing demand management elements including a detailed description of each element with the dates or period of introduction;

(D) alternative demand management solutions to supply deficiencies, if applicable, including the feasibility of establishing a no demand increase policy for new service connections, which would require potential customers to invest in water saving programs within the existing system which would save the amount of water needed to serve new development;

(E) a program to provide technical assistance to major users in the performance of water audits and in the formulation and implementation of retrofitting. Such programs shall:

(i) provide a list of the current major users with their annual water use for the last year of record in gallons per day, and type of use, prioritizing those which have the greatest potential to conserve water;

(ii) describe and evaluate the water audit programs available to the major users, including the following categories of water use: process, sanitary, domestic, heating, cooling and outdoor, for each customer; the areas in which overall efficiency of water use can be improved, and an estimate of water savings if improvements are made;

(iii) address recycling, reuse, process changes, replacement or retrofitting, and other efficiency measures; the areas in which peak demands can be reduced and the estimated amount of the reductions; leak detection services which can be offered to consumers; a written report to the customer, with specific recommendations, projected water savings, implementation cost estimates and pay-back period estimates;

(iv) report on past program accomplishments since the last water supply plan, including the number of audits performed, and a summary of estimated water use reduction achieved; and

(v) describe any additional technical assistance that has been undertaken or is planned;

(F) plumbing retrofit programs that:

(i) briefly describe any residential retrofit program since the last water supply plan; and

(ii) describe how water companies that are supply deficient or anticipate development of a new source of supply within the next ten years will investigate ways to encourage residences to retrofit with additional efficient and water-conserving appliances and fixtures and ways to encourage the retrofitting of process and domestic uses of commercial, industrial, and institutional users;

(G) water rates and pricing information that:

(i) discusses the present rate structure; and

(ii) assesses rate structure alternatives and frequency of billing to evaluate their anticipated impact on water conservation. Rate structure alternatives to be assessed include: eliminating or consolidating the blocks of existing declining block rate structures; implementing a separate uniform metered rate for each user category or for all consumption by the elimination of declining block rates; minimizing customer service charge that will recover no more than the minimum costs of reading meters, billing of customers, and meter-related costs; implementing seasonally increased rate structures to reduce peak demands; implementing an inclining block structure for all metered consumption or for each user category; for water companies not regulated by the Department of Public Utility Control, assessing enterprise fund accounting with a program for establishing full-cost pricing and self-sustaining budgets; and

(H) a public education program that:

(i) addresses water conservation for all residential, industrial, commercial, institutional, agricultural, and public authority customers, and evaluates the following components for inclusion: advice to local hydrant users about proper utilization and maintenance of hydrants; bill stuffers; consumer education on self monitoring using home water meters; displays at home shows, fairs, libraries, and town halls; displays or information regarding water efficient plantings and gardening methods and native landscaping; education program for municipal and water company employees; notification to customers with unusually high recorded uses to check for household leaks; newspaper and magazine articles; pamphlets, handbooks, posters, newsletters, and billboards; information to homeowners on more efficient means of watering lawns and ornamental shrubs; speakers on various water conservation topics; and school programs. If there is an existing program, it shall discuss how it can be continued or, if necessary, what improvements should be made in the program;

(ii) describes how the program of public education will be implemented; and

(iii) addresses compliance with sections 25-32k and 25-32*l* of the Connecticut General Statutes, to provide to residential customers, without charge, educational materials or information on water conservation.

(4) The supply management section of the water conservation plan shall:

(A) state the goals and objectives for supply management;

(B) discuss a meter management program, with the discussion including:

(i) a schedule for one hundred percent source metering in compliance with subsection (n) of section 19-13-B102 of the Regulations of Connecticut State Agencies within five years, if all sources of supply are not currently metered; details on the current source meter reading, testing, calibrating, repair, and replacement program; the adequacy of the metering program and a schedule of activities necessary to correct deficiencies and to achieve source metering objectives; and the extent of metering of other major system components; and

(ii) the extent of consumer metering, plans to expand metering, and the current frequency of meter testing, maintenance and calibration, and the replacement rate; the benefits of metering all individual, residential, commercial, industrial, and public authority customers, if no metering is in place or if there is only partial metering; whether existing meters are of appropriate size and design type; and if meter downsizing should be implemented to reduce lost water;

(C) determine, by means of an annual evaluation of the water supply system, the amount, location, and causes of non-revenue water; discuss the annual water system evaluation process based on the actual evaluation data from the previous five years, or if such data is unavailable, on the most current calendar or fiscal year data; and discuss the results and conclusions of such evaluations and where applicable plans to reduce non-revenue water; and

(D) discuss the current leak detection and repair program and any plans to expand leak detection efforts and plans to reduce water lost from leaks, including the following:

(i) an explanation of the method used for leak detection and description of the sensitivity of the equipment used;

(ii) a discussion based upon the most recent leak detection survey, if one has been performed, of the number of leaks found, the number fixed, the estimated amount of water saved, and the existing leakage rate in gallons per day per mile;

(iii) a discussion of the existing and projected costs of this program and an evaluation of the cost effectiveness of further distribution system rehabilitation to correct sources of lost water; and

(iv) if leak detection and repair objectives have been achieved, a discussion of the planned continuing maintenance program to retain and achieve the lowest leakage rate feasible; and

(E) evaluate the effects that a pressure reducing program would have with respect to water conservation and discuss plans to reduce water losses through pressure reduction.

(5) A five year implementation plan shall be developed providing a schedule and estimated budget for implementing selected demand and supply management measures.

(6) This analysis of the impacts of water conservation practices shall discuss the procedures and criteria to measure the effectiveness of the water conservation measures to be implemented.

(i) Provide an evaluation of source water protection measures. The evaluation shall analyze potential hazards to public drinking water sources of supply. This evaluation shall also, at a minimum, include the following information:

(1) Drinking water sources of supply identified in the 5-year planning period of the approved water supply plan, including all active, emergency, and future drinking water sources of supply;

(2) Identification of critical lands to be protected, in table format, including: number of acres by town for all water company-owned lands; percentage or acreage of land owned or controlled within 200 feet of ground water wells, through easement or other means; number of acres for all source water protection areas; and number of acres of public or privately-

owned protected lands located within each source water protection area if known or available;

(3) An inventory of land use activities for each delineated source water protection area, in table format, that are of immediate concern to water quality, or have a significant potential to contaminate a public drinking water supply, as determined by a public water system. Such inventory shall be based on: 1) source water assessment reports developed by the Department of Public Health and; 2) inspection reports or survey data, or both, compiled or maintained by the public water system. The following supportive information shall also be provided:

(A) For each delineated source water protection area: a description and location of inventoried land use activities with significant potential to contaminate; and an assessment as to which of these activities are the most significant regarding the potential to contaminate a public drinking water source of supply.

(B) Description and location of any historic spills, discharges or environmental issues which occurred within the delineated source water protection area, that may affect sources of supply, or are of immediate concern to water quality;

(C) A compilation of untreated water quality data for each source of public drinking water, required under section 19-13-B102(c) of the Regulations of Connecticut State Agencies for the previous five years, and a summary analysis of such data. Test results, if available, for volatile and synthetic organic chemicals shall also be included in the compilation and summary analysis.

(4) A narrative describing:

(A) Land use activities with the most significant potential to contaminate, as assessed and identified in subdivision (3)(A) of this subsection;

(B) Information about plans or programs to reduce potential public health risks for each inventoried land use activity of immediate concern to water quality, to include;

(i) Engineering controls,

(ii) Drinking water source protection management plans,

(iii) Recognized best management practices or other strategies.

(C) Existing state, local, and regional land use plans, policies, classifications and zoning ordinances as they relate to drinking water source protection within the source water protection area; and

(D) The public water system's drinking water source protection program including a discussion of measures to strengthen source water protection within each delineated source water protection area.

(Adopted effective August 10, 2000; Amended August 3, 2006)

Sec. 25-32d-4. Calculation of safe yield

(a) **Surface water sources.** Safe yield shall be developed using a mathematical mass balance methodology and shall be based on a ninety-nine percent dry year or a critical dry period with a 1 in 100 occurrence frequency and shall be based on the usable storage capacity of a reservoir which can be used without additional equipment or treatment, except that the safe yield may be less due to requirements for the passing of minimum stream flows or other release requirements. The statistical frequency analysis shall be performed by developing a low flow duration curve using the adjusted stream gaging data for the critical drawdown duration. All surface water safe yield analyses shall be performed by an individual with a minimum of five years experience in surface water analysis and a bachelor's or advanced degree from an accredited college or university in hydrology or related engineering field, or a professional engineer licensed in accordance with Chapter 391 of the Connecticut General Statutes with a minimum of five years experience in surface water analysis. For cases where a mass balance analysis cannot be performed due to insufficient usable storage volume, such as run of the river type situations or diversions, the safe yield shall be determined based upon an analysis of the streamflow for a ninety nine percent dry year assuming a seven day average flow duration. Information developed for other sections of the water supply plan may be referenced, if appropriate. The methodology for determining the safe yield of surface water supplies shall include the following:

(1) Inflow into the reservoir shall be based on gaged streamflow data collected from within the watershed or calculated from measured historical reservoir levels. Where such data is not available, unregulated stream gaged data from another watershed (external) which closely approximates the watershed of interest shall be used as determined by a verification analysis of historic inflows or reservoir levels versus the selected gage. Factors to consider when selecting the external gaging station shall include amount of stratified drift, land uses, slope, stream length, length of record, vegetation and geomorphology. The selected stream gage flow record or historic inflow record shall be of sufficient length and period of record as necessary to perform the required frequency analysis in subdivision (10) of this subsection. In cases where historic reservoir data is insufficient or unavailable for a verification procedure, then the selected gage shall have similar watershed characteristics and worst case low flows.

(2) Operating rules. The operating rules for the movement of water, reservoir conditions, and operation of the reservoir or reservoir system shall be listed and described. Reservoir conditions shall include the total and usable reservoir storage capacity; top and bottom elevation of the reservoir dam; spillway elevation, length and type; elevations and diameters of water supply intakes; and use of flashboards. Operating rules shall address conjunctive use of multiple reservoirs or wells, diversions, alternate release patterns, and operation of reservoirs in series or parallel. Operating rules shall be utilized in performing safe yield calculations.

(3) Computational interval. The mass balance analysis shall utilize a computational interval of no more than one month. Daily flow analysis may be required to appropriately model flood skimming diversions or low flow diversions unless truncated flow hydrographs are developed.

(4) Diversions. The safe yield analysis model shall include any diversions of water into

or out of the watershed. The operating characteristics, flow capacity of the diversions and the runoff to the point of diversion shall be provided. Both existing and proposed diversions shall be analyzed, provided such proposed diversions are identified as needed within the five year planning period.

(5) Withdrawal rates. The reservoir outflow due to water withdrawal shall be varied on a monthly basis, based upon historic withdrawals for the last five year period of record. All supportive data shall be provided.

(6) The safe yield analysis shall be extended to determine the time to refill after the critical dry period assuming normal system operation, annual withdrawal rates equal to the calculated safe yield and inflow from the period immediately following the critical dry period.

(7) The safe yield of surface water sources shall be analyzed as a combined multiple reservoir system based upon a flow routing analysis and specified operating rules, unless previously approved by the department.

(8) Safe yield model inflow.

(A) Developing inflow record. The flow record for the chosen streamflow gage shall be adjusted to the watershed being analyzed by a ratio of the watershed area being analyzed to the watershed area of the selected streamflow gage. Further adjustment may be necessary to calibrate the safe yield model based upon verification procedures.

(B) Verification of safe yield model. In cases where an external stream gage is utilized, the inflow data shall be verified by comparing the end of period storage levels predicted from the chosen streamflow gage record against the actual measured historical reservoir levels from a representative dry period. Operating rules indicated to be in use during the chosen dry period shall be used for the verification procedure.

(C) Period of record. The entire period of record using mass balance methodology shall be analyzed to determine the critical dry period.

(D) Usable storage. The reservoir yield shall be developed using usable storage capacity based on bathymetric or topographic surveys and shall factor in sediment deposition. The calculation of usable storage excludes storage based on flashboards and water that cannot be accessed without special use of pumps or other emergency techniques.

(E) Direct precipitation. Direct precipitation on the surface area of the reservoir shall be calculated using the closest representative precipitation gage for the historic critical dry period or the ninety nine percent exceedance. Published data shall be used where possible. If unpublished data is used the data shall be submitted in support of the analysis. Water companies may choose to use the net impact of the direct precipitation minus the evaporation. The precipitation data shall be based on an interval no greater than one month.

(9) Safe yield model outflow

(A) Evaporation rates. The safe yield analysis shall incorporate monthly evaporation rates computed over the surface area of the reservoir either as calculated at the end of each computational interval or, assuming a constant surface area based upon two-thirds of usable storage capacity. Monthly evaporation rates as listed in this sub-paragraph shall be used in the safe yield analysis:

Evaporation rates (inches per month)	
January	0.85
February	0.93
March	1.51
April	2.15
May	4.15
June	5.10
July	5.61
August	5.25
September	3.64
October	2.60
November	1.66
December	1.34

(B) Consumptive losses to the watershed shall be evaluated.

(C) Dam leakage. Leakage rates shall be based upon field measurements or data obtained from the Department of Environmental Protection. If data is not available, then use of an estimated value is acceptable.

(D) Minimum streamflow releases. The minimum streamflow release shall be determined in accordance with Sections 26-141a-1 through 26-141a-26, inclusive, of the Regulations of Connecticut State Agencies and, where applicable, Sections 22a-365 through 22a-378, inclusive, of the Connecticut General Statutes, and the regulations adopted pursuant to Section 22a-377 of the Connecticut General Statutes. This requirement may be met by dam leakage and required riparian releases which equal or exceed the required minimum releases.

(10) 1 in 100 occurrence frequency. A statistical frequency analysis shall be performed using a Log-Pearson Type III distribution analysis to confirm that the average inflows over the critical drawdown duration equal or exceed a 1 in 100 occurrence frequency. A minimum of thirty years of streamflow record is required, unless otherwise approved by the department. The computed 1 in 100 occurrence frequency flow for the specified critical drawdown duration shall then be compared to the average flows for the same historic period. If necessary to meet or exceed the 1 in 100 occurrence frequency requirement, the inflow record shall be modified by a ratio adjustment and the mass balance analysis shall be rerun accordingly.

(A) All low-flow data used in computing Log-Pearson Type III frequencies shall be non-zero values. If zero values have occurred, then the statistical parameters, such as mean, standard deviation, and skew, shall be adjusted as recommended by the United States Geological Survey in technical memorandum number 89.11, available from the United

States Geological Survey.

(B) For critical drawdown durations exceeding three hundred and sixty five days, the data to be used in the frequency analysis shall be non-independent values based upon flow periods equal to the critical drawdown duration within consecutive overlapping years.

(C) If the inflow record utilized in the safe yield analysis exceeds the 1 in 100 occurrence frequency, then, at the water company's option, the inflow record may be modified by a ratio adjustment to exactly meet but not be under the 1 in 100 occurrence frequency requirement and the mass balance analysis rerun accordingly.

(11) Submittal requirements. The water companies required to submit plans shall submit information on the dam leakage quantities, precipitation, riparian releases, minimum streamflow releases or an indication of exemption to such releases, critical drawdown duration, drought duration, 1 in 100 year low flow value, frequency analysis, safe yield computations including input and output, schematic of the reservoir system and stage or storage tables and curves, and the stage or area tables and curves, for approval. All sources of data used in the safe yield analysis shall be referenced. A summary graph of reservoir storage versus time for the critical dry period and extended to refill shall be submitted.

(b) **Ground water sources.** Safe yield of all active wells shall be computed based upon simultaneous pumping tests of all wells in the wellfield and adjusted for the maximum drawdown available during a critical dry period. The pumping tests shall be performed in accordance with subdivision (3) of this subsection. Ground water safe yield analyses shall be performed by an individual with a minimum of five years experience in ground water analysis in a glaciated geomorphological setting and a bachelor's or advanced degree from an accredited college or university in a ground water related science or related engineering field, or by a professional engineer licensed in accordance with Chapter 391 of the Connecticut General Statutes with a minimum of five years experience in ground water analysis in a glaciated geomorphological setting.

(1) The standard method of adjusting pumping test data to account for the critical dry period shall be based on one of the following:

(A) For all ground water sources, a multiplier of seventy-five percent, equivalent to an eighteen hour pumping day, shall be applied to the pumping test rate. This adjustment factor shall be applied for calculating and making adjustments for the critical dry period. The resulting safe yield shall be reported in units of both gallons per minute, and gallons or million gallons per day. In addition to the critical dry period adjustment factor, an additional multiplier of ninety percent shall be applied to bedrock or consolidated aquifer ground water sources.

(B) Pumping test data shall be analyzed and adjusted for the critical dry period using methodologies appropriate to the hydrogeologic setting and published methodologies as approved by the department. Analytical methodologies shall include steps to:

(i) correct pumping test data for significant ambient water level variations. The corrections shall be based on precipitation and static water level influences observed prior to and during the pumping test;

(ii) analyze impacts from no-flow boundaries, surface waters, existing pumping wells and any other hydrogeologic influences as evidenced by pumping test data;

(iii) project a 180 day pumping event assuming no precipitation recharge;

(iv) use analytical methodologies or modeling techniques to determine safe yield and adjust for the critical dry period. At ungaged sites, regional equations or base-flow measurements, in conjunction with United States Geological Survey Open-File Report 91-244, available from the United States Geological Survey, or Connectcut Water Resources Bulletin Number 34, available from the State of Connecticut Department of Environmental Protection, or other reference deemed comparable by the commissioner, shall be used to estimate the streamflow condition with a seven day duration and a one in ten year recurrence frequency; and

(v) demonstrate that the water levels at the end of the critical dry period shall be maintained above the intakes.

(2) An alternative method for analyzing pumping test data may be made at the water company's option in cases where stabilized water levels are above the pump intake or water levels did not stabilize and predicted water levels are above the pump intake after an extrapolation of drawdown over 180 days of pumping. The alternative method may be used in such cases to indicate the additional yield of the well above the installed pumping capacity at the time of the pumping test and, if stabilization did not occur, show that the aquifer has sufficient storage to sustain pumping at the higher rate during the critical dry period and is intended to indicate the maximum well yield attainable with pump replacement, modification, or increased capacity. The alternate method shall meet the following criteria:

(A) Analytical methodologies or modeling techniques appropriate to the hydrogeological setting and published methodologies as approved by the department shall be applied to predict water levels at the higher pumping rate.

(B) The analysis technique shall take into account mutual interference effects on all wells located in the same wellfield.

(C) Corrections for the critical dry period shall be performed in accordance with subparagraphs (A) or (B) of subdivision (1) of this subsection.

(3) Wellfield pumping tests used in determining safe yield shall satisfy the following criteria:

(A) A pumping test shall be conducted with all wells in the wellfield pumping simultaneously to determine time-drawdown characteristics of the pumped wells. The rate of pumping of all wells shall be constant throughout the pumping test. Each well shall be individually metered. For wellfields with more than one well, existing data from individual, non-simultaneous pumping tests of each well in the wellfield that meet the other pumping test requirements may be utilized, provided corrections are made for mutual interference.

(B) Pumping test duration. The pumping test shall be conducted for at least the minimum duration as required in Section 19-13-B51k of the Regulations of Connecticut State Agencies.

(C) Stabilization. Stabilization shall be achieved for the last twelve hours prior to completion of the pumping test. If, after the required pumping test duration, stabilization is not achieved then the pumping test shall be extended, or an analysis and extrapolation of pumping test drawdown versus time data shall be performed to show whether there is sufficient storage in the aquifer to sustain the pumping rate for 180 days of continual operation and maintain water levels above the pump intake. If the projection shows the pump intake would be reached, a reduced pumping rate shall be calculated based on specific capacity at the end of the pumping test such that the pumping level at the reduced rate remains above the pump intake.

(D) Interference effects. The drawdown tests shall run simultaneously for all wells located within the same wellfield unless interference effects can be shown to be minimal or can be properly estimated using analytical methodologies or modeling techniques.

(E) Where contaminants can reasonably be expected to be drawn into the wellfield during the test, the maximum pumping rate may be further limited by the department.

(F) Antecedent conditions

(i) The pumping test shall be conducted following a period of five days during which precipitation does not exceed one-half inch during any twenty-four hour period, and one inch in any seventy-two hour period.

(ii) Precipitation at the site of the pumping test shall be monitored daily beginning one week prior to start-up of pumping through completion of the pumping test, where applicable, using equipment capable of measuring precipitation to within one hundredth (0.01) of one inch.

(iii) Water level measurements in the pumping well or nearby monitoring wells shall be collected at least daily for at least one week prior to the start of testing.

(iv) For currently developed wells, the wellfield shall be shut down for at least three days prior to the start of testing, unless such shut down is not feasible and the department approves pumping at the minimum possible rate for the background shut down period.

(G) Drawdown measurements. Drawdown in each pumping well shall be measured hourly, or at such frequency that accurately measures drawdown to properly document the trend leading up to stabilization, and as necessary for proper analysis of pumping test data.

(H) Ground water level measurement accuracy. Ground water level measurements shall be obtained with a measuring tape, electric line, or pressure transducer accurate to two one hundredths (0.02) of a foot; unless direct access is not feasible without performing major modifications to the well, then airline readings may be utilized.

(I) Discharge of pumped water. The water withdrawn from the well during a pumping test shall be discharged so as not to interfere with the test.

(J) Surface water levels shall be measured to the nearest two one hundredths (0.02) of a foot and recorded at least twice daily during the duration of the pumping test for all surface water bodies within 500 feet of the pumping well.

(K) The criteria in subparagraphs (A) through (J) of this subdivision shall be used in calculating safe yield, unless the water company demonstrates to the department that any variations from these criteria had no noticeable effect or that the effect can be negated through the use of analytical methods. Induced infiltration tests performed in accordance with subparagraph (B) of subdivision (4) of subsection (d) of Section 22a-354b-1 of the Regulations of Connecticut State Agencies regarding level A mapping are considered to fully meet the pumping test requirements.

(4) Submittal requirements. The following items shall be submitted in support of the calculated ground water safe yield:

(A) static water level before pumping;

(B) date, time and duration of pump test;

(C) pumping rate in gallons per minute;

(D) drawdown records of time and measured water;

(E) date, time and amounts of precipitation;

(F) location of discharge point;

(G) well driller’s log;

(H) physical well data regarding well construction, screen lengths and intervals, well development and diameter;

(I) graphs of drawdown or depth to water versus time plotted arithmetically if stabilization was achieved, or plotted on semi-logarithmic paper and extrapolated to 180 days if stabilization was not achieved;

(J) static water levels without any pumping and stabilized water levels during continuous pumping;

(K) rated pump capacity and pump curves;

(L) limitations on pumping, if any;

(M) other pertinent ground water modeling or testing data if utilized; and

(N) justification, description and reference information for use of selected methodology.

(c) Where sufficient historical records are available, data on the safe yield of any sources available during a critical dry period may be used if approved by the department.

(1) For existing wells, production records spanning a dry period of low streamflow recharge and below normal precipitation recharge may be used if approved by the department, provided that a sufficient margin of safety is maintained as demonstrated in subdivision (8) of subsection (b) of section 25-32d-3 of the Regulations of Connecticut State Agencies, that a new or expanded source of supply or a new or revised diversion permit is not needed within the five year planning period, and that the well or wells can be shown to have consistently produced the average rate over a multi-year period of record on an annual basis and over the seasonal low water table period extending from July to November. In such cases where historic production records are proposed to be used for calculating groundwater safe yield, the critical period adjustment in subparagraphs (A) and (B) of subdivision (1) of subsection (b) of this section shall be applied.

(2) The average production rate shall be based upon metered production records at each individual source of supply and the approved yield shall not exceed the current installed pump or treatment capacity.

(3) The following data shall be provided to the department:

(A) historic long term production records encompassing a representative dry period, including average day, maximum month average day, and peak day withdrawal rates; and

(B) available information as listed in subdivision (11) of subsection (a) of this section and subdivision (4) of subsection (b) of this section.

(d) Safe yield analyses previously performed that substantially meet the requirements of this section may be submitted in lieu of the study required by this section and shall be reviewed by the department on a case by case basis.

(e) The reduction in safe yield imposed by any constraints such as hydraulic considerations, system losses, treatment limitations, or interference effects shall be considered in the calculation of available water for all active sources.

(f) Other methods may be used provided that they are approved by the Department of Public Health and the Department of Environmental Protection and ensure an adequate water supply.

(Adopted effective August 10, 2000)

Sec. 25-32d-5. Submittal, completeness and approval

(a) **Plan submittal**

(1) The water company shall submit to the department three copies of the initial plan, revised plan or modified plan.

(2) At the time of plan submittal the water company shall also provide four copies of the initial plan, revised plan or modified plan to the commissioner of Environmental Protection, two copies to the executive secretary of the Department of Public Utility Control, one copy to the secretary of the Office of Policy and Management, and one copy to each regional planning organization covering any portion of the company's existing or proposed source or service area.

(3) The department shall notify each chief elected official, local health official and regional planning organization covering any portion of the company's existing or proposed source or service area of the existence of the plan and the opportunity to comment thereon.

(4) A copy of the initial plan, revised plan or modified plan shall be maintained on file by the water company, at a water company business office located nearest to the sources of supply and service areas considered in the plan, for review by interested persons during normal business hours. The water company shall notify the department at the time of submission as to the location and hours that the plan is available for public review.

(b) **Mechanism for determining plan completeness**

(1) The Department of Environmental Protection and the Department of Public Utility Control, in the case of any plan which may impact any water company regulated by the Department of Public Utility Control, shall have sixty days upon receipt of the initial plan, revised plan or modified plan to comment to the department on the completeness of the plan. Failure of either the Department of Environmental Protection or the Department of Public Utility Control, in the case of any plan which may impact any water company regulated by the Department of Public Utility Control, to comment within sixty days shall

be deemed acceptance that the plan is complete as submitted.

(2) The commissioner shall notify the water company in writing if a plan is deemed to be incomplete and shall request additional information necessary to deem the plan complete. The schedule for submission of modifications shall be determined by the commissioner.

(3) When the commissioner makes a determination and notifies the water company that the plan is complete, the commissioner shall concurrently send notice of the determination of completeness to the Department of Environmental Protection, the Department of Public Utility Control and the Office of Policy and Management.

(c) **Process for plan approval, modification, or rejection**

(1) The Department of Environmental Protection and the Department of Public Utility Control, in the case of any plan which may impact any water company regulated by the Department of Public Utility Control, shall have ninety (90) days upon notice that a plan is deemed complete to comment on the plan. In the event that either the Department of Environmental Protection or the Department of Public Utility Control, in the case of any plan which may impact any water company regulated by the Department of Public Utility Control, fails to provide written comments within ninety (90) days, the Department of Public Health shall notify, in writing, both departments of such failure, and in sixty (60) days from issuance of such notice, the Department of Public Health shall make a determination on approval, modification, or rejection of the plan using all available information. If within sixty (60) days following the issuance of such notice, the Department of Public Utility Control or the Department of Environmental Protection provides written comments on such plan, the Department of Public Health shall approve or reject such plan as appropriate based on such comments. If within sixty (60) days of the issuance of the above notice, the Department of Public Utility Control or the Department of Environmental Protection fails to provide written comments on such plan, such department shall upon expiration of such sixty (60) day period issue a letter concurring with such plan and the Department of Public Health shall approve or reject such plan as the Department of Public Health deems appropriate. Notwithstanding the above, the Department of Public Health may reject any plan deemed acceptable to the Department of Public Utility Control and the Department of Environmental Protection.

(2) The department in making a decision to approve, modify or reject a plan shall consider the following:

(A) the ability of the company to provide a pure, adequate and reliable water supply for present and projected future customers;

(B) adequate provision for the protection of the quality of future and existing sources;

(C) comments from state agencies; and

(D) consistency with state regulations and statutes.

(3) Within sixty days after the Department of Environmental Protection and the Department of Public Utility Control, in the case of a water company regulated by that agency, have commented to the department regarding whether a plan should be approved, or in no case more than one hundred and fifty days after written notice that the plan has

been deemed complete, the commissioner shall advise the water company whether the plan is rejected, approved or approved with conditions.

(4) If the commissioner fails to approve or reject the plan within the timeframes required by Section 25-32d(c) of the Connecticut General Statutes and this subsection, the plan shall be deemed approved as submitted.

(5) If the commissioner rejects the plan, he shall advise the water company in writing that the plan is being rejected and the reason the plan cannot be approved as submitted.

(6) Appeal procedures. The water company may appeal to the commissioner the department's determination that a plan is not complete or the department's decision to modify or reject a plan, in accordance with Chapter 54 of the Connecticut General Statutes.

(d) **Approved plan distribution.** The company shall submit ten copies of the final approved plan or approved modified pages to the department, which shall distribute copies to the Department of Environmental Protection, the Department of Public Utility Control and the Office of Policy and Management. The company shall submit one copy of the approved plan or approved modified pages to each regional planning organization and notice of the approved plan to all local health departments, and municipal planning departments or agencies, covering any portion of the existing or proposed source or service areas. One copy of the approved plan shall be provided by the water company to any such agency requesting a copy.

(Adopted effective August 10, 2000)

Sec. 25-32d-6. Failure to submit a plan

Any failure to submit a water supply plan in accordance with Sections 25-32d-1a through 25-32d-5, inclusive, of the Regulations of Connecticut State Agencies shall be subject to civil penalties in accordance with Section 25-32e of the Connecticut General Statutes and Section 25-32e-1 of the Regulations of Connecticut State Agencies.

(Adopted effective August 10, 2000)

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

Raul Pino, M.D., M.P.H.
Commissioner

Ned Lamont
Governor

Susan Bysiewicz
Lt. Governor

Recommended Procedure

SUBJECT:
Alternative Method for Analyzing Pumping Test

APPLICABLE REGULATION:
RCSA Section 25-32d-4(b)(1)(A):
For all ground water sources, a multiplier of seventy-five percent, equivalent to an eighteen hour pumping day, shall be applied to the pumping test rate. This adjustment factor shall be applied for calculating and making adjustments for the critical dry period. The resulting safe yield shall be reported in units of both gallons per minute, and gallons or million gallons per day. In addition to the critical dry period adjustment factor, an additional multiplier of ninety percent shall be applied to bedrock or consolidated aquifer ground water sources.

RCSA Section 25-32d-4(b)(2):
An alternative method for analyzing pumping test data may be made at the water company's option in cases where stabilized water levels are above the pump intake or water levels did not stabilize and predicted water levels are above the pump intake after an extrapolation of drawdown over 180 days of pumping. The alternative method may be used in such cases to indicate the additional yield of the well above the installed pumping capacity at the time of the pumping test and, if stabilization did not occur, show that the aquifer has sufficient storage to sustain pumping at the higher rate during the critical dry period and is intended to indicate the maximum well yield attainable with pump replacement, modification, or increased capacity. The alternate method shall meet the following criteria:
(A) Analytical methodologies or modeling techniques appropriate to the hydrogeological setting and published methodologies as approved by the department shall be applied to predict water levels at the higher pumping rate.
(B) The analysis technique shall take into account mutual interference effects on all wells located in the same wellfield.
(C) Corrections for the critical dry period shall be performed in accordance with sub-paragraphs (A) or (B) of subdivision (1) of this subsection.

ADVISORY GROUP MAKEUP & TASK:
The Ground Water Safe Yield Advisory Group, which consists of the following members: Corinne Fitting of DEEP, Dave Radka of CTWC, Wayne Bugden of CME, Jeff Lennox of LBG, Dave Murphy of M&M, Peter Galant of T&B, Glenn Warner of UCONN, and Jim Mullane of

USGS; had several conference calls between February and July 2014 to discuss & recommend the analytical methodologies that can be applied to predict water levels at the higher pumping rate per RCSA Section 25-32d-4(b)(2)(A).

In doing so, the following two criteria were considered by the group:

1) Is the proposed analytical method appropriate to predict water levels at the higher pumping rates?
2) Is it taking into account mutual interferences effects on all wells located in the same well-field?

ADVISORY GROUP RECOMMENDATION:

The group recommended the following for consideration of the appropriate analytical method to predict water levels at the higher pumping rates:

- Based upon simultaneous pumping tests of all wells located in the same wellfield,
- Stabilization as defined in water supply plan (WSP) regulation is achieved during the pumping test,
- Applicable to wells located in sand and gravel aquifers (stratified drift only),
- Will not exceed the screen design capacity and screen design standard (entrance velocity not to exceed 0.1 ft/sec),
- Will maintain a minimum of 5' of water above the intake,
- Will not significantly decrease the aquifer saturated thickness,
- Account for mutual interference effects on all wells located in the same wellfield,
- The increase is capped at no more than 50% for a wellfield and 100% for an individual well pumping test rate,
- Analysis completed and provided by an individual meeting the minimum requirements set in WSP regulation,
- In aquifers with lower than average transmissivity and lower well specific capacities, the analyst should evaluate whether the measured specific capacity at the end of the test should be adjusted downward for the calculations of additional test yield. One approach is to analyze step test data, if available, and
- Multiplier of 75% is applied to the adjusted pumping rate calculated during this analysis.

CONCLUSION:

The Drinking Water Section of the Department of Public Health finds the Group recommendation to be acceptable and adopts this procedure for utilization pursuant to the afore noted applicable regulations.

DATE: 04/21/2015

APPENDIX B

Resume of Analyst

SCOTT J. BIGHINATTI, MS, CFM
LEAD ENVIRONMENTAL SCIENTIST

Project Assignment
Project Manager, Safe Yield Evaluation

Years of Experience
With This Firm: 14

Education
M.S., 2005, Natural Resources – Land, Water, & Air
University of Connecticut
Storrs, Connecticut

B.S., 2001, Natural Resources
University of Connecticut
Storrs, Connecticut

Certification
40 Hour HAZWOPER
Certified Floodplain Manager

Computer Capabilities
AquiferTest – Pumping Test Analysis
ArcGIS Desktop 10
MODFLOW – Groundwater Flow Analysis
MODPATH – Particle Tracking
GPS Pathfinder Office – Portable GPS
STELLA – Environmental Model

Summary of Experience

Mr. Bighinatti is a project manager with 14 years of experience providing environmental planning services throughout New England and New York. His expertise is most often applied towards utility planning, water resource permitting, regulatory compliance, environmental impact evaluations, hazard mitigation planning, aquifer protection area mapping, hydrologic and hydrogeologic modeling, and spatial analyses utilizing GIS.

Related project experience to this effort includes the following:

Safe Yield Analysis

- ***Source Water Study and Minimum Streamflow Impacts – Manchester, Connecticut***
  Prepared update to surface water safe yield calculations to account for required streamflow releases and updated groundwater safe yield calculations to be consistent with current DPH procedures. Safe yield calculations were used to recalculate available water in order to revise projected margin of safety calculations. Conceptually evaluated potential new groundwater sources, modifications of existing sources, and interconnections to supplement existing supply. Prepared drought contingency plan to guide reservoir operations during drought periods. Prepared Streamflow Reporting Forms for seven reservoirs in accordance with the Streamflow Standards and Regulations.

- ***Groundwater Safe Yield Evaluation – Multiple Systems in Connecticut***
  Reviewed information for approximately 125 wells to determine if existing information meets current DPH safe yield methodology. Provided recommendations for wells to be analyzed under an alternative methodology and which should be evaluated by a formal safe yield pumping test. Analyzed the safe yield of 40+ wells under the alternative methodology and prepared summary report.

- ***Safe Yield Analysis & Water Supply Plan – Middletown, Connecticut***
  Performed a 72-hour pumping test and prepared safe yield analysis of existing wellfield along the Connecticut River. Assisted with preparation of the City's *Water Supply Plan* update.

Water Resource Protection

- ***Alternate Water Supply Feasibility Study – Monhegan Plantation, Maine***
  Prepared numerical model to evaluate existing and future water supply withdrawals from sand and gravel aquifer and the potential for saltwater intrusion.

- ***Level A Mapping of Killingly Industrial Park Wellfield – Killingly, Connecticut***
- ***Level A Mapping of Vernon Wells 1, 2, and 4 – Vernon, Connecticut***
- ***Level A Mapping of C.W. House Wellfield – Farmington, Connecticut***
- ***Level A Mapping of Brooklyn Wellfield – Brooklyn, Connecticut***
- ***Level A Mapping of Plainfield Wellfield – Killingly, Connecticut***
- ***Level A Mapping of Thompson Wellfield – Thompson, Connecticut***
- ***Level A Mapping of Dennison Well – Essex, Connecticut***
- ***Level A Mapping of Clinton Well – Clinton, Connecticut***
- ***Level A Mapping of Saybrook Well – Old Saybrook, Connecticut***
- ***Level A Mapping of Chimney Heights Well – Bethel, Connecticut***
- ***Level A Mapping of Gallup Wellfield – Plainfield, Connecticut***
- ***Level A Mapping of Indian Field Wellfield – Prospect, Connecticut***
- ***Level A Mapping of Willimantic River (River Park) Wellfield, Tolland, Connecticut***
  Prepared a data collection plan and implemented a Level A aquifer pumping test for public water supply wells to characterize impacts to stream flows, wetlands, and groundwater levels. Supervised the installation of monitoring wells, installed and maintained automatic dataloggers throughout the test period, and prepared numerical groundwater model delineating areas of contribution and recharge for the wellfield. Prepared final Level A mapping report delineating the area of influence, groundwater contribution, direct recharge, and indirect recharge. Particle tracking was adjusted to identify potential areas of contribution based on strong vs. weak sink settings.

- ***Level A Mapping of Charter Oak Wellfield, Manchester, Connecticut***
- ***Level A Mapping of New Bolton Road Wellfield, Manchester, Connecticut***
  Developed numerical models to delineate areas of influence, ground water contribution, direct recharge, and indirect recharge based on previous pumping test data. Particle tracking was adjusted to identify potential areas of contribution based on strong vs. weak sink settings.

- ***Willimantic River Study, University of Connecticut, Mansfield, Connecticut***
  Performed installation and data collection for in-stream flow and hydrogeology study of the Willimantic River, including measurement of streamflow, groundwater levels, surface water levels, and delineation of habitat areas. Installed and maintained five automatic data loggers to monitor surface and groundwater levels and barometric pressure throughout the test period. Prepared a numerical groundwater model delineating the influence of pumping wells on the river under various pumping management scenarios. Performed a Uniform Continuous Under Threshold (UCUT) analysis to define implementation of water conservation scenarios based on fish habitat stressor thresholds and prepared a summary report.

- ***Septic System Discharge Compliance – Westport, Connecticut***
- ***Septic System Discharge Compliance – Old Saybrook, Connecticut***
  Prepared a numerical ground water model depicting mounding from existing septic system and conducted particle tracking to determine flow direction from the ground water mound.

Water Supply Permitting

- ***Gallup Wellfield – Plainfield, Connecticut:*** Prepared water diversion permit renewal application supporting continued withdrawal of water from the Gallup Wellfield to serve central Plainfield. Updated the numerical model of the wellfield to estimate potential impacts to wetlands and watercourses.

- ***Chimney Heights Wellfield – Bethel, Connecticut:*** Prepared a water diversion permit application, including hydrogeologic report and environmental report utilizing the Level A numerical groundwater model to determine potential wetland impacts.

- ***River Park Wellfield, Tolland Water Commission – Tolland, Connecticut:*** Performed wetland monitoring and prepared a water diversion permit application, including hydrogeologic report and environmental report utilizing the Level A numerical groundwater model to determine potential wetland impacts.

APPENDIX C

Production Well Logs and Pumping Test Data for Fenton River Wellfield

Thomas, C. E. Jr., Bednar, G. A., Thomas, M. P., and Wilson, W. E., 1967, *Hydrogeologic Data for the Shetucket River Basin, Connecticut*, USGS, Connecticut Water Resources Bulletin No. 12.

Table 1.--Records of wells--Continued

Current UConn Well #

Well no.	Location	Owner	Date com-pleted	Alti-tude (feet)	Type of well	Depth of well (feet)	Dia-meter (inches)	Depth of casing (feet)	Depth to bed-rock (feet)	Water-yielding material	Static water level (feet below land surface)	Static water level: Date of measure-ment	Yield (gpm)	Draw-down (feet)	Use	Remarks
										Town of Mansfield						
Ms 3a	414929N721643.1	J. Topich	4- 3-56	585	Drc	145	6	69	64	Bedrock	27	4- 3-56	6	73	Dom	
Ms 5	414505N721553.1	P. J. Moeckel	12-31-55	270	Drc	80	6	55	50	Bedrock	20	12-31-55	10	60	Dom	
Ms 6	414411N721448.1	H. Sullivan	2-21-57	425	Drc	99	6	74	40	Bedrock	10	2-21-57	30	30	Dom	C.
Ms 8	414347N721243.1	N. Bandas	11-24-58	268	Dr	117	6	117		Gravel	23	11-24-58	7	77	Dom	Finished in gravel.
Ms 9	414544N721120.1	F. Keith	1-25-58	260	Drc	156	6	137	137	Bedrock	40	1-25-58	15	0	Dom	
Ms 17	414533N721111.1	Zearzow		265	Dug	40.5	24			Sand	28.4	5-14-58			Aban	
Ms 19	414547N721143.1	C. T. DeBoer	-57	260	Dug	21.4	36			Sand and gravel	9.8	5-27-58			Obs,Aban	Obs.well, 1958-64
Ms 20	414805N721827.1	C. Snow		330	Dug	10.0	32			Gravel	5.7	11-30-62			Obs,Aban	Obs.well, 1962-64.
Ms 21	414814N721815.1	Mansfield State Training School		407	Dug	13.3	36			Till	9.8	7-10-63			Obs,Aban	Obs.well, 1963-64. Dry, Sept., 1963, and Sept. to Oct., 1964.
Ms 22	414401N721510.1	A. Bergeron	10- 3-58	290	Dr	107	6	40	35	Bedrock	11	10- 3-58	20	69	Dom	C.
X Ms 23	414858N721854.1	Mansfield State Training School MTS# 1	-13(?)	300	Dug	16.5	240			Sand and gravel	5.4	5-27-64			Aban	Formerly supplied school; replaced by Ms 24 and Ms 25 because of insufficient yield.
X Ms 24	414853N721856.1	do MTS# 2	-48	300	Dr	60	12	35		Sand and gravel	.5	3- -48	525	19	Inst	C. Screen, 25-slot, 35-60 ft. Used alternately with Ms 25.
3 Ms 25	414855N721856.1	do MTS# 3	-58	303	Dr	68	16	48	79	Sand and gravel	4.0	7-24-64	418	9	Inst	C. L. P. Screen, 48-68 ft. Used alternately with Ms 24.
Ms 25a	414857N721855.1	do	-58	304	Dr	28.9	6	30(?)		Sand	7.7	6-24-64			Aban	P. Obs.well during pump test of Ms 25.
Ms 25b	414855N721858.1	do	-58	300	Dr	34.0	2.2	33.5		Sand	3.7	6-26-64			Aban	L. Well point. Obs.well during pump test of Ms 25.
Ms 26	414543N721417.1	D. Goodwin	-58	515	Dr	184	6		35	Bedrock	17	-58	8	123	Dom	C. At 60 ft, yield was 1.5 gpm; at 120 ft, 5 gpm; at 174 ft, 8 gpm.
Ms 27	414727N721220.1	O. Olsen	5-15-56	305	Drc	115	6	46	46	Bedrock	40	5-15-56	4.5	60	Dom	C.
Ms 28	414731N721118.1	D. Squires	10- 1-55	380	Drc	130	6	12	12	Bedrock	16	10- 1-55	3	89	Dom	C.
Ms 29	414621N721140.1	T. Sovald	4-20-63	280	Drc	152	6	109	109	Bedrock	53	4-20-63	20	87	Dom	
Ms 30	414805N721423.1	E. E. Weeks	7- 1-58	608	Drc	173	6	8	3.5	Bedrock	3	7- 1-58	20	127	PS	C. One of 3 wells supplying about 75 people in trailer park.
Ms 31	414503N721538.1	J. McShea		330	Drc	118	6		40	Bedrock	29		3	89	Dom	C.
Ms 32	414447N721143.1	N. Chobot	9-12-62	240	Dr	93	6	14	11	Bedrock	50	9-12-62	15	25	Dom	C.
Ms 33	414919N721355.1	Univ. of Conn. A	-27	295	Dug	20	12	10		Sand and gravel			235		Inst	C. Screen, 10-20 ft.
Ms 34	414924N721405.1	do B	-50	311.8	Dr	73.2	12	53	73+	Gravel	8.0	7-21-50	675	24.5	Inst	C. L. Gravel packed; screen, 250-slot, 53-73 ft.
Ms 35	414925N721408.1	do C	-50	312.5	Dr	65	12	45	65	Gravel	7.3	7-21-50	520	19.0	Inst	C. L. Gravel packed; screen, 250-slot.
Ms 36	414855N721338.1	do D	-57	290	Dr	60	12	45	60	Sand and gravel	7	1-10-49	400	14	Inst	C. L. Gravel packed; screen, 45-60 ft.
Ms 37	414807N721633.1	A. L. Pepe	10-15-56	485	Drc	177	6		31	Bedrock	19	-56	4.8	81	Dom	
										Town of Norwich						
Nwh 12	413521N720258.1	Conn. State High-way Dept.	10- -57	65	Dr	272	8		50	Bedrock			20		Com	Highway garage. Yield of 8 gpm at 240-250 ft.
Nwh 30	413335N720245.1	Seeley Thermos, Thermos Div		30	Dr	30	8	10	30	Sand	12.3	12-27-63	240	7	Aban	Formerly used for cooling. Twice was pumped dry. Gravel pack, screen.
Nwh 31	413457N720333.1	E. Kulos	12- 5-63	250	Drc	104	6	74	68	Bedrock	22	12- 5-63	12	63	Dom	C. Main water-bearing fracture at 100 ft.
Nwh 37	413534N720307.1	Occum Water Co.	-62	75	Dug	17	36	17		Sand and gravel					PS	C. Pumped 10 to 100 gpm, depending on season.
Nwh 38	413535N720306.1	do	-64	75	Drc	173	6	20	20	Bedrock			25		PS	C. Pumped 25 gpm, 14 hrs/day.
										Town of Pomfret						
Po 58	415050N720237.1	L. King		721	Dug	20.7	20			Till	12.1	4-26-62			Aban	
Po 65	415420N710220.1	E. Sirrine		817	Dug	25.4	24			Till(?)	19.0	7- 2-62			Dom	Adequate, 1958-61.
Po 66	415357N720209.1	Mrs. E. K. Medbury	-58	815	Dug	16.9	30			Till	5.4	6-30-62			Dom	C.
Po 67	415358N720205.1	do	-57	851	Drc	220	6	$55^{\pm}$					0		Des	No water obtained.

APPENDIX D.

R. E. CHAPMAN CO.

Contractors for ARTESIAN WELLS

TEST BORING, ENGINEERING AND INSTALLATION OF COMPLETE WATER SYSTEMS

OAKDALE, MASSACHUSETTS
AMHERST, MASSACHUSETTS

TEL. W. BOYLSTON 47
TEL. AMHERST 92-W

NUMBER 2 AKA WELL B

March 25, 1949

Mr. Allen Hubbard
Hubbard, Lawless and Blakeley
110 Whitney Avenue
New Haven 10, Connecticut

Dear Mr. Hubbard:

Enclosed is the record of the pump test on the two wells at Storrs. Number 2 was pumped at 675 gallons per minute and, based on the drawdown at this rate of pumping, you will be able to pump 700 gallons per minute with an ample factor of safety.

What we do not know is the effect of heavy pumping on the water table in that area during a prolonged dry period but we have every reason to expect that this area will stand up very well under such pumping since it draws on a very large water shed.

We are enclosing also, for your approval, the invoices covering this work.

Hoping that our work has proved satisfactory in every way, we are

Yours very truly,
R. E. Chapman Co.

Robert E. Chapman
President

CC Mr. James McElroy, Comptroller's Office, State House, Hartford
Mr. William P. Boyle, General Delivery, Storrs, Connecticut

D-Z

University of Connecticut, Storrs, Connecticut

Pump test of 18" Stabilized Gravel Packed Wells #1 and #2, using two 6" pumps and one 4" pump

March 14-18, 1949

WELL C @ 5?? gpm — WELL B @520 gpm

Date	Time	18" No. 1	#1 2" Obs.	#2 2" Obs.	18" No. 2	#3 2" Obs.	#4 2" Obs.	Tube #1	#
14-49	2:30 p.m.	19' 8"	19'	11' 10"	21' 3"	5' 1½"	4' 11"	18-"	1
	3:00	21' 1"	19' 3"	11' 10"	21' 10"	5' 11"	4' 11"	18-"	1
	3:30	21' 7"	20' 7"	11' 10"	22' 1½"	8' 9"	4' 11"	18-"	1
	4:00	22'	21' 5"	11' 10"	22' 8"	9' 10"	4' 11½"	18-"	1
	4:30	22' 2"	21' 6"	11' 10"	22' 8"	9' 11"	4' 11½"	18"	1
	6:00	22' 8"	21' 10½"	11'	22' 9"	10' 1"	4' 11"	18"	1
	8:15	23' ½"	22' 6"	11' 10"	22' 9"	10' 8½"	4' 11"	18'	1
	10:30	23' 7"	22' 11"	12' 2"	22' 9"	11' 4"	4' 11"	18"	1
.5-49	12:20 p.m.	23' 10"	23' 2"	13'	22' 11"	11' 6"	4' 11½"	18"	1
	2:00	23' 11"	23' 2"	13' 8"	23' 1"	11' 7"	4' 11½"	18"	1
	3:25	23' 9"	23' 3"	14' 4"	23' 2"	11' 10"	4' 11"	18"	1
	6:00	23' 10"	23' 3"	14' 4"	23' 2"	11' 10"	4' 11"	18"	1
	8:10	23' 10"	23' 3"	14' 7"	23' 2"	11' 10"	4' 11½"	18"	1
	8:30	23' 10"	23' 3"	14' 7"	23' 2"	11' 10"	4' 11½"	18"	1
	9:40	23' 10"	23' 3"	14' 8"	23' 2"	11' 10"	4' 11½"	18"	1
	11:45	23' 10"	23' 2"	14' 7"	23' 2"	11' 10"	4' 11"	18"	1
6-49	9:15 a.m.	18' 10"	19' 1"	11' 10"	@675 gpm 24' 4"	8' 9"	5' 2"	18"	22
	10:55	22' 3"	21' 9"	11' 10"	26' 6"	9' 5"	5' 3½"	18"	22
	12:30 p.m.	22' 10½"	22' 4"	12' ½"	26' 8"	10' 10"	5' 3½"	18"	22
	3:35	23' 8"	22' 1"	12' 8"	27' 1½"	10' 11"	5' 3½"	18"	19
	4:35	23' 9"	22' 7"	12' 11"	27' 1½"	11' 2"	5' 4"	18"	19
	6:30	23' 11"	23'	13' 5"	27' 2"	11' 7"	5' 4"	18"	19
	9:55	24' 3"	23' 9"	14' 10½"	27' 1"	11' 11"	5' 5½"	18"	19
	11:05	24' 4"	23' 10"	15' 5"	27' 1"	12' 2"	5' 5"	18"	19

520 GPM

675 GPM

	Time	18" No. 1	#1 2" Obs.	#2 2" Obs.	18" No. 2	#3 2" Obs.	#4 2" Obs.	Tube #1
49	1:45 a.m.	24' 4½"	23' 10"	15' 6"	27' 1"	12' 4"	5' 6½"	18"]
	3:10	24' 4"	23' 10"	15' 6"	27' 1"	12' 3½"	5' 6"	18"]
	6:00	24' 4"	23' 10"	15' 6"	27' 1"	12' 4"	5' 6"	18"]
	8:05	24' 4"	23' 10"	15' 6"	27' 1"	12' 4"	5' 6"	18"]
	10:10	24' 4"	23' 10"	15' 7½"	27' 2"	12' 4"	5' 5½"	18"]
	11:45	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 5½"	18"]
	2:00 p.m.	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 6"	18"]
	4:30	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 6"	18"]
	7:15	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 6"	18"]
	10:00	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 6"	18"]
18-49	1:20 a.m.	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 6"	18"]
	3:25	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 6"	18"]
	6:10	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 6"	18"]
	8:05	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 62	18"]
	10:30	24' 4"	23' 10"	15' 7"	27' 2"	12' 4"	5' 6"	18"]

RECOVERY

	18" No. 1	18" No. 2
1 minute	12' 7"	14' 11"
5 minutes	9' 11"	10' 2"
10 minutes	9' 9"	8' 9½"
15 minutes	9' 3"	8' 1"
2½ hours	8' 6½"	7' 6"
Monday, March 21	5' 4"	2' 8"

11 #5 #1 Gravel Packed: Measurements from ground level. 5" Orifice on 6" pipe. Static level 5' 4".

11 #6 #2 Gravel Packed: Measurements from ground level. 6" Orifice on 8" pipe. Static level 2' 8". 300 feet east of #1 gravel packed well.

#1 Observation: Measurements from top of pipe; two feet above ground. Distance from cente of Gravel Packed #1: 7 feet. Static level 7' 6".

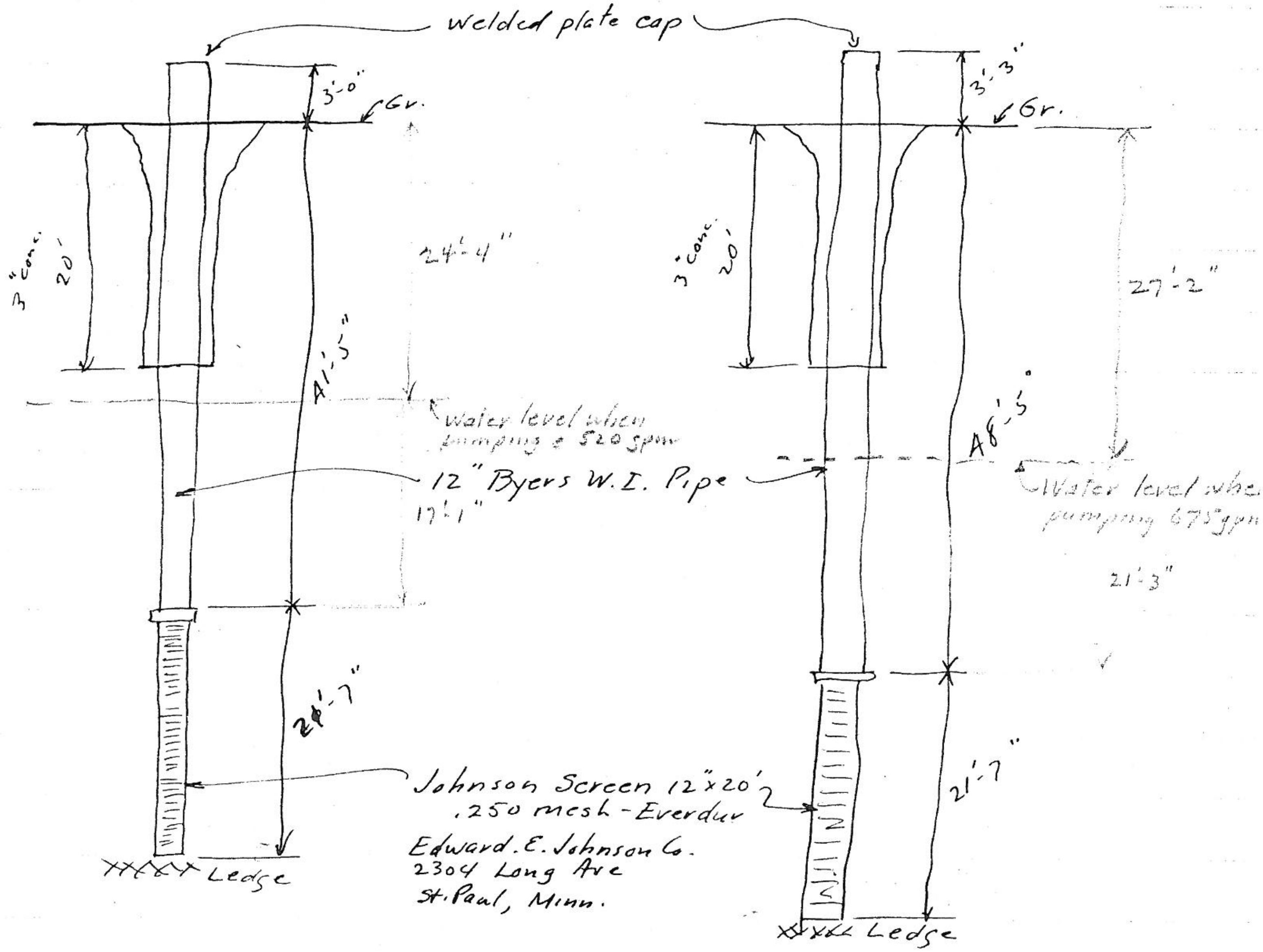
#2 Observation: Measurements from top of pipe; two feet 6 inches above ground. On right side of road, about 300 feet from Gravel Packed #1. Static level 11' 10".

#3 Observation: Measurements from top of pipe; two feet 2 inches above ground. Distance from center of Gravel Packed #2: 6 feet. Static level 4' 7".

#4 Observation: Measurements from top of pipe; three feet 8 inches above ground. Distance from center of Gravel Packed #2; 53 feet. Static level 4' 11".

Pumps stopped at 11:45 p.m. on March 15 to install 4" pump on Gravel Packed well #2. Started again at 9:15 a.m. on March 16.

Wells as installed by R. E. Chapman Co.
Completed tests at 10:30 AM March 18, 1949



Well #5

to be pumped @ 500 gpm

C

Well #6

to be pumped @ 700 gpm

B

INCLUDES WELL'S B+C D-5

UNIVERSITY OF CONNECTICUT, STORRS, CONNECTICUT

site well water supply

Gravel Packed Well at site of Test Well #3N 11/16/48- 12/8/48

0' - 5'	Boulders
5' -42'	Medium Gravel
42' -45'	Hardpan and boulders
45' -	Ledge

Total depth of well from ground level, 42 feet 4"
10- feet 12" #250 slot Everdur Metal Well Screen set at 42 feet 4"
33 feet 4" of 12" Wrought Iron pipe - 1 foot above ground

Static Water Level: 11' 10" from top of pipe
Static Water Level in Test Well #2N: 11' 4" from ground level
Statis Water Level in Test Well #4N: 14' 6" from top of pipe, 2" above (ground level

Pumped 150 gallons per minute with 14- feet drawdown - not tested for any length of time.

Pulled out at 1/3/49 - 1/4/49. Time: 7 hours

2" Observation Well - 47' in depth - jetted in 1/4/49

8" Test Wells

#1 - 800 feet south of main well - 12/8/48

0' - 5'	Brown Clay
5' -10'	Gravel
10' -47'	Boulders. clay, and gravel
47' -53'	Ledge

#2 - 800 feet southeast of main well - 12/9/48 - 12/10/48

0' - 25'	Boulders, clay and gravel
25' - 40'	Water-bearing gravel
40' -	ledge

Set 15-foot #100 test screen at 40 feet. Pump test with 4" shallow- well pump. Static Water Level 8'7" from top of 8" pipe- 1' 6" above ground. Tota pumping time, including installind and removing: $11\frac{1}{2}$ hours. 4" orifice on 6" pipe.

Time	8" Well	Outside obs. Well	Tube	G. P. M.
7:10 a.m.	24' 11"	9' 10"	$7\frac{1}{2}$"	175
9:00	25' 1"	10'	$7\frac{1}{2}$"	175
12:00 noon	25' 2"	10'	$7\frac{1}{2}$"	175
2;20 p.m.	25' 2"	10'	$7\frac{1}{2}$"	175
4;15	25' 2"	10'	$7\frac{1}{2}$"	175

#3 - 600' southwest of main well - 12/10/48

0' - 5'	Clay, boulders, hardpan
5' - 25'	Water-bearing gravel
25' -	Ledge

Set 10- foot #100 test screen at 25 feet. Pumped with a 4" shallow-well pump for two hours. 75 gallons per minute.

#4 - 1200 feet north of main well - 12/13/48

0' -	5'	Fine sand and clay
5' -	20'	Boulders, hardpan, gravel
20' -	40'	Brown gravel and boulders
40' -		Boulders

#5 - 1200 feet north of main well - 6 feet from #4 - 12/13/48 -12/17/48

0' -	5'	Fine sand and clay
5' -	20'	Boulders, hardpan, gravel
20' -	40'	Brown gravel - water-bearing
40' -	63'	Light gravel - water-bearing
63' -		Ledge

Set 20- feet # 200 test screen at 63 feet. Static water level from top of pipe(above ground 1'-3") 7'-5". Static level in #4 - 6' 2" from ground. Pump test with 4" shallow- well pump. Total pumping time, inclu ing installing and removing- 50½ hours. 55-feet discharge line. Left i 31' of 2" observation pipe and 3' well point: total, 34'. Pipe 1'-10" above ground.

TEST WELL FOR FUTURE WELL C (PR)

Date	Time	8" Well	#4 Well	Tube	G. M. P.
12/15/48	12:00 noon	7' 5"	6' 2"	00	00
	12:00	21' 2"	10' 6"	27"	325
	4:30 p.m.	21' 8"	10' 8"	27"	325
	10:40	21' 11'	11' 2"	27"	325
16/48	3:00 a.m.	22' 10"	11' 8"	27"	325
	7:00	22' 10"	11' 8"	27"	325
	9:30	22' 10"	11' 9"	27"	325
	11:25	22' 10"	12' 1"	27"	325
	12:00 noon	22' 10"	12' 1"	27"	325
	2:45 p.m.	22' 10"	12' 2"	27"	325
	4:10	22' 10"	12' 2"	27"	325
	8:30	22' 10"	12' 2"	27"	325
	11:20	22' 10"	12' 2"	27"	325
12/17/48	1:15 a.m.	22' 10"	12' 2"	27"	325
	3:00	22' 10"	12' 2"	27"	325
	5:00	21' 8"	12' 2"	27"	325
	7:30	21' 8"	12' 2"	27"	325
	9:40	21' 8"	12' 2"	27"	325
	11:20	21' 8"	12' 2"	27"	325

RETURN WATER LEVEL

	8" Well	#4 Well
1 min.	9' 7"	9' 4"
5 min.	9' 3"	8'
15 min.	8' 7"	6' 10"
1 hr.	7' 9½"	6' 4"
3½ hrs.	7' 5½"	6' 3"

#6- 350 feet southeast of #5 - 12/22/48 - 12/31/48

0' -	20'	Soft gray clay
20' -	25'	Hardpan and gravel
25' -	70'	Water-bearing gravel
70' -	72'	Ledge

3 #6 cont.

Set 20-feet #100 test screen at 70 feet. Pump test with 4" shallow-well pump: 300 gals. per. min. with 8' 6" drawdown. Pumped 10 hrs. pipe 4' 5" above ground.

2" Observation wells - 35' deep -6' 10" south of 8" well. Pipe 2' 3" above ground. - 50' deep 53' south of 8" well. Pipe 5' 1" above ground.

Pump test with 6" shallow-well pump. 5" Orifice. 15 feet discharge into river.

TEST WELL FOR FUTURE WELL B

te	Time	8" Well	#1 Obs.	#2 Obs.	#5 Test	Tube	G.P.M.
29/48	7:00 a.m.	8' 2"	5' 8"	4' 11"	7' 10"	00	00
	8:00	25' 8"	9' 7"	5'	7' 10"	$17\frac{1}{2}$ "	500
	9:00	25' 10"	9' 8"	5' $1\frac{1}{2}$"	7' $10\frac{1}{2}$"	$17\frac{1}{2}$ "	500
	9:30	25' $10\frac{1}{2}$"	9' 9"	5' $11\frac{1}{2}$"	7' 11"	$17\frac{1}{2}$ "	500
	11:15	26' 4"	10' 2"	7' 8"	8' 2"	$17\frac{1}{2}$ "	500
	12:00 noon	26' 10"	10' $3\frac{1}{2}$"	7' 11"	8' 3"	$17\frac{1}{2}$ "	500
	1:15 p.m.	27' 2"	10' 7"	8' 2"	8' 4"	$17\frac{1}{2}$ "	500
	2:05	27' 2"	10' 9"	8' $4\frac{1}{2}$"	8' 4"	$17\frac{1}{2}$ "	500
	3:00	27' 2"	10' 10"	8' 5"	8' $5\frac{1}{2}$"	$17\frac{1}{2}$ "	500
	6:00	27' $6\frac{1}{2}$"	11' 3"	8' 8"	8' 7"	$17\frac{1}{2}$ "	500
	11:15	27' 11"	11'	9' 1"	8' 10"	$17\frac{1}{2}$ "	500
30/48	2:40 a.m.	28'	11' 2"	9' 1"	9'	$17\frac{1}{4}$ "	500
	4:00	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	6:15	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	7:30	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	9:05	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	10:00	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	11:00	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	12:00 noon	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	1:30 p.m.	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	2:45	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	3:15	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	5:10	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	9:00	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	11:30	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
/31/48	1:25 a.m.	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	4:15	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	6:00	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500
	8:05	28' 1"	11' 2"	9' 10"	9' 1"	$17\frac{1}{2}$ "	500

RETURN OF WELL

1 min.	11' 1"
5 min.	10' 10"
15 min.	10' 5"
30 min.	10' 1"

#7 - Near main well - 1/4/49

0' - 30'	Coarse water-bearing gravel
30' - 43'	Hardpan and gravel
43' -	Ledge

#8 - 300 feet on road from main well - 1/5/49

0' - 20'	Boulders - hard gravel
20' - 38'	Fine brown sand and clay
38' -	Ledge

#9 - South end of State Land, near gravel pit - 1/6/49 - 1/7/49

0'	- 10'	Coarse gravel
10'	- 45'	Coarse sand
45'	- 59'	Coarse gravel
59'	-	Ledge

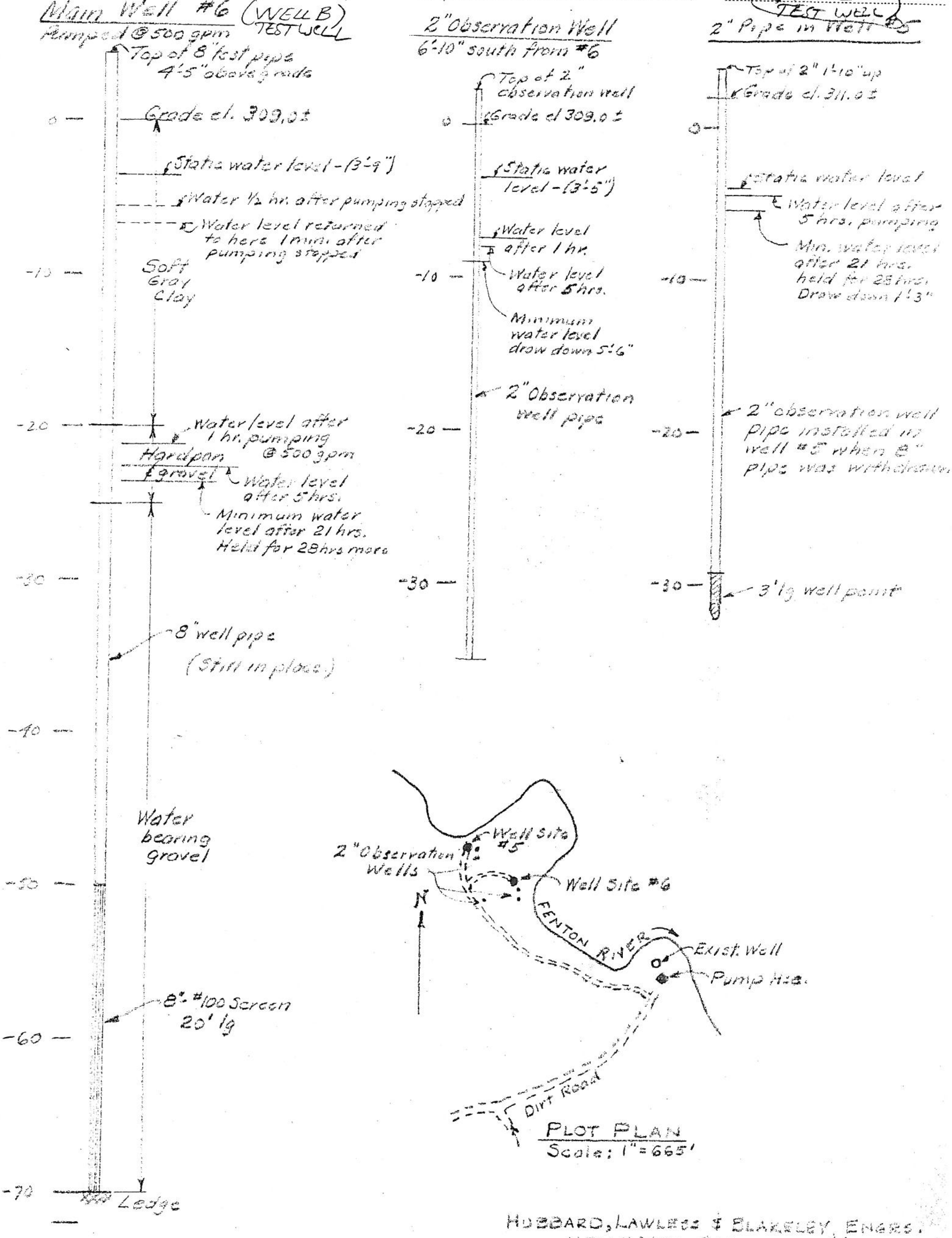
Set 20- feet #100 test screen at 59 feet.

BY .... DATE 1-25-49 SUBJECT Univ. of Conn. Well #6 SHEET NO. 2 OF 2

CHKD. BY .... DATE .... Test 12/29-31/48 1948? JOB NO. 914 D-9

by R.E.Chapman Co.

WELL B TEST WELL



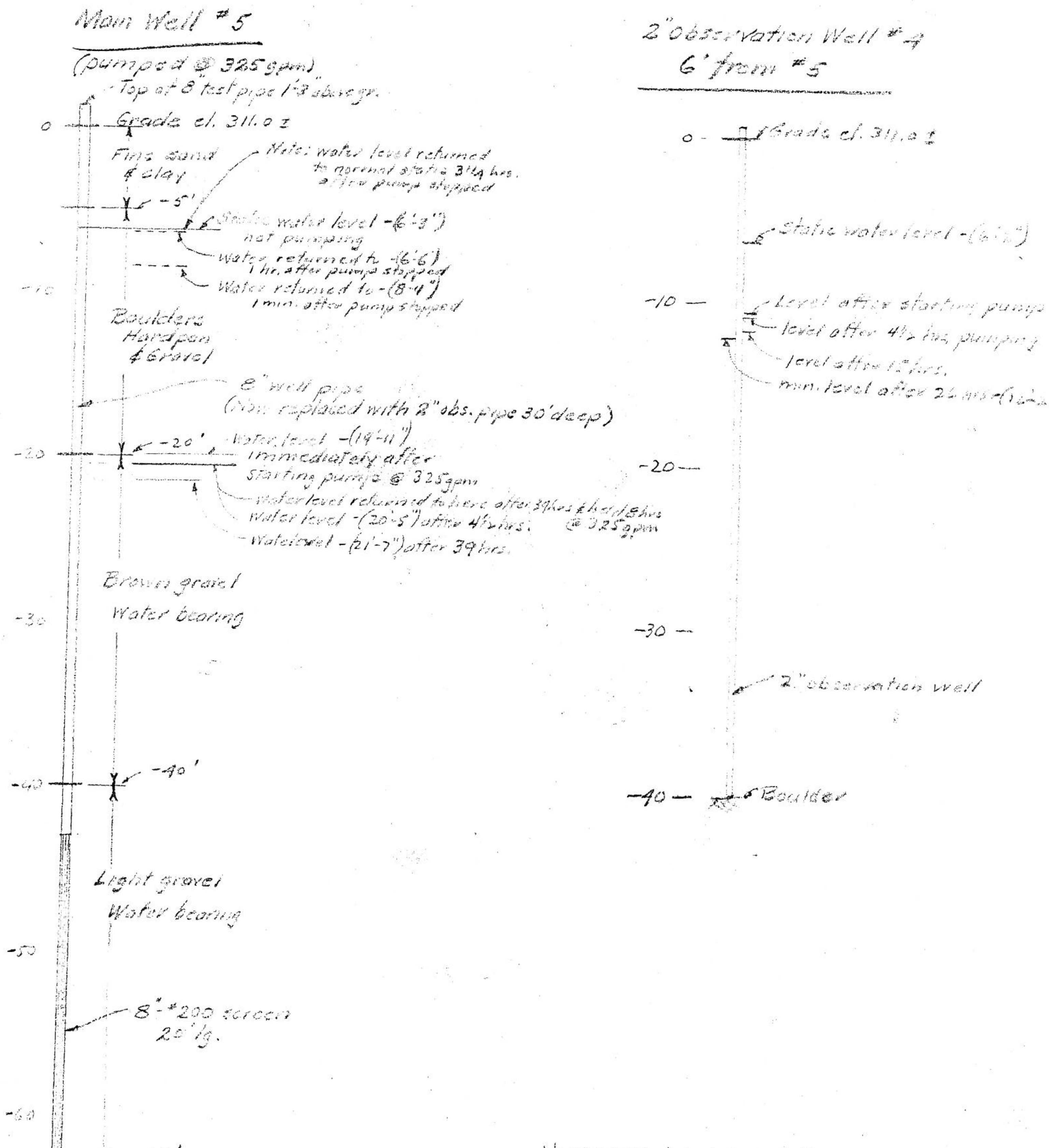
HUBBARD, LAWLESS & BLAKELEY, ENGRS.
NEW HAVEN CONN.

BY .... DATE 1-25-49 SUBJECT Univ. of Conn. - Well #5
CHKD. BY .... DATE .... Test 12/15-17/48
by R.E. Chapman Co.

SHEET NO. 1 OF 2
JOB NO. 914 D-11

WELL C - TEST WELL

NOTE: THIS IS TEST WELL #5 AS AN 8" WELL
LATER DEVELOPED AS 12X18 GP



HUBBARD, LAWLESS & BLAKELEY, ENGRS.
NEW HAVEN, CONN.

NEW PAGE

FAIRBANKS, MORSE & CO.
Pump & Hydraulic Division

WELL B

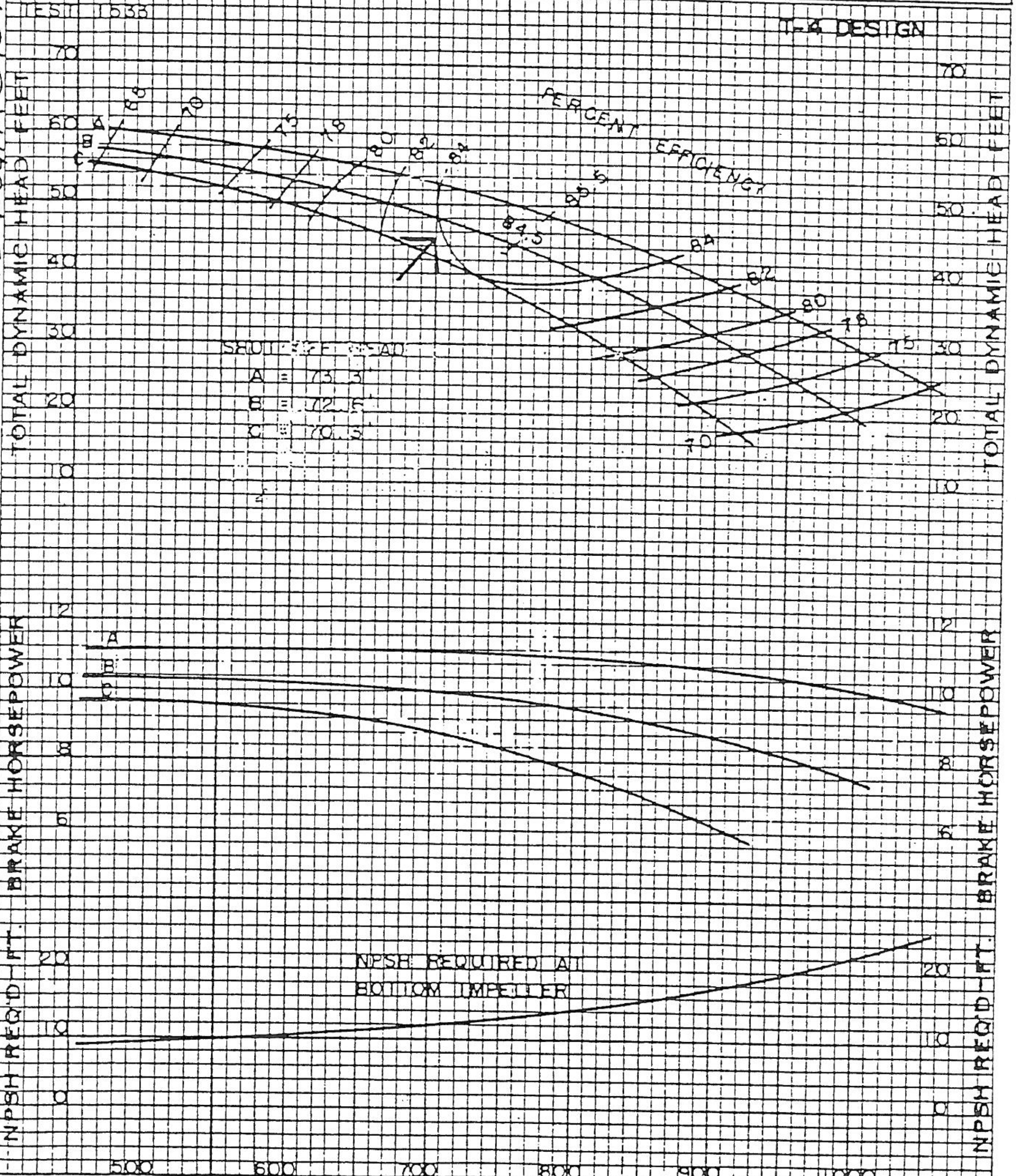
D-11

P1129
July 1, 1961

PER STAGE PERFORMANCE 12" L C FIG. 6970 1770 R.P.M.

NUMBER OF STAGES	EFFICIENCY CHANGE		
→ 1	LOWER 5 PTS.	IMPELLER BRONZE	HYDRAULIC PERFORMANCE IS CONTINGENT ON FURNISHING THE PUMP WITH SPECIFIED AMOUNT OF CLEAR, FRESH, NON-AERATED WATER NOT TO EXCEED 85° F.
~~2~~	~~LOWER 1 PTS.~~	BOWL ENAMELED C.I.	
		BOWL DIA. 11-1/2	
		K_T = 13.2	

PUMP S/N AK3784 COND: 700GPM @ 45' TDH



FORM NO. APEX.100.29

U.S. GALLONS PER MINUTE

MOTOR Well Pump B   LOCATION Feather River

Name Plate Data

HP 10   FLA 26.4/13.2   VOLTS 220/440   FR 324P

RPM 1740   Hz 60   Ph 3   S.F. —

MODEL # 12F6006V   RUN HOURS 10 hrs/day

SERIAL # PEJ6792424   MANUFACTURER GE

Measured Data

VOLTS 440   FLA 15.5   P.F. [illegible]

Motor overloaded by [illegible]

Calculated Data

KVA 11.5   KW 9.3   KVAR [illegible]

PUMP B

Name Plate Data

MODEL # Pomona Turbine Pump   SERIAL # AK3784

SIZE   GPM   FT. HEAD

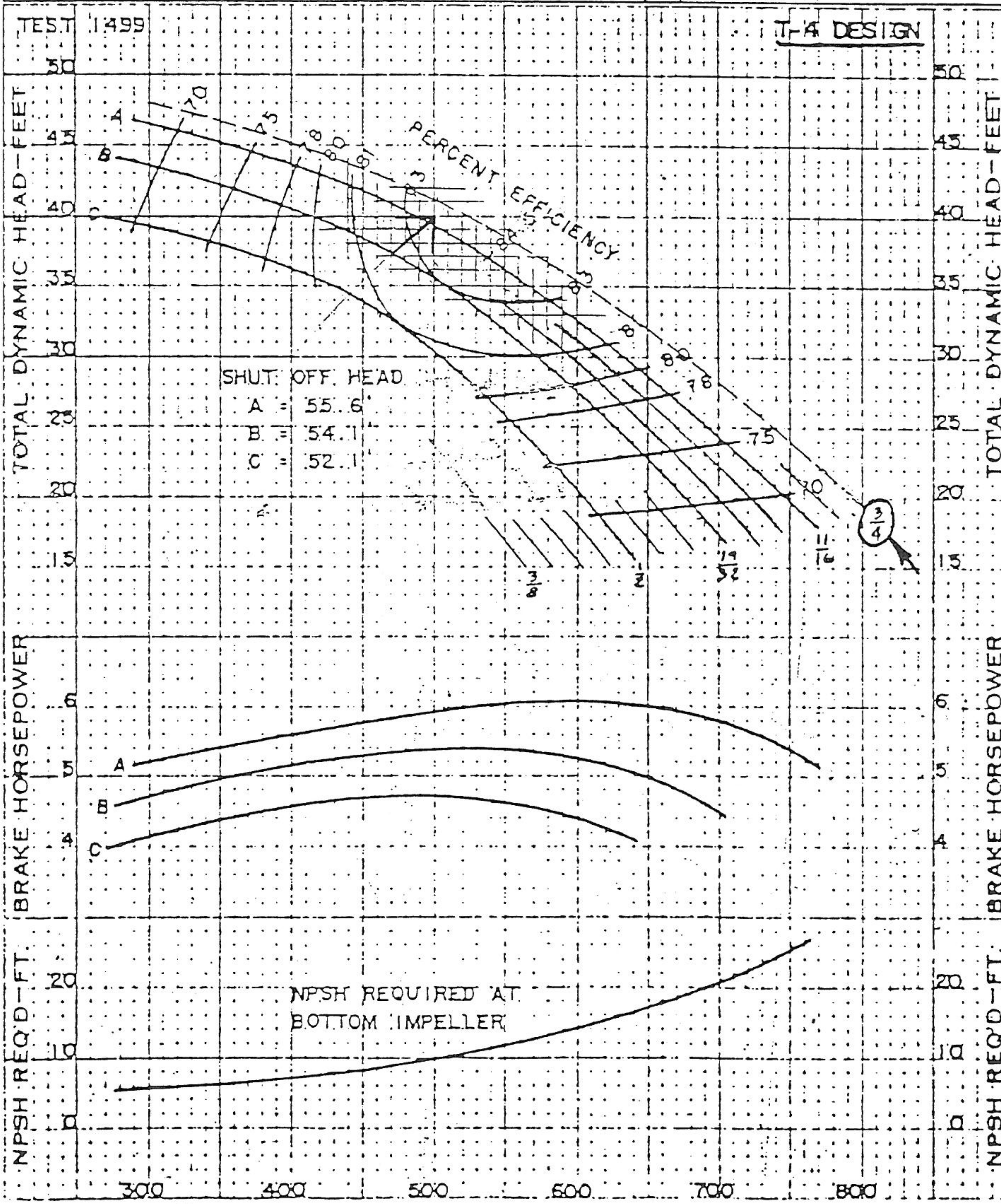
RPM   MANUFACTURER Fairbanks Morse

PUMP S/N AK3780 COND: 500 GPM @ 40' TDH

WELL C

PER STAGE PERFORMANCE 10" LC FIG. 6970 1770 R.P.M.

NUMBER OF STAGES	EFFICIENCY CHANGE		
1 ~~2~~	LOWER 5 PTS. ~~LOWER 1 PTS.~~	IMPELLER BRONZE BOWL ENAMELED C.I. BOWL DIA. 9-3/8" K_T = 9.0	HYDRAULIC PERFORMANCE IS CONTINGENT ON FURNISHING THE PUMP WITH SPECIFIED AMOUNT OF CLEAR, FRESH, NON-AERATED WATER NOT TO EXCEED 85° F.



U.S. GALLONS PER MINUTE

FORM NO APEX 100 29

D-14

Univ. of Conn. - Well System

MOTOR Well Pump C

LOCATION Fenton River

Name Plate Data

HP 7 1/2 FLA [illegible]/10.1 VOLTS [illegible] FR

RPM 1755 Hz 60 Ph 3 S.F.

MODEL #

RUN HOURS 3 hrs/day

SERIAL #

MANUFACTURER Fairbanks - Morse

Measured Data

VOLTS 440 FLA 10.5 P.F. 79.5 [illegible]

Motor [illegible]

Calculated Data

KVA 8 KW 6.4 KVAR 4.9

PUMP C

Name Plate Data

MODEL # Pomona Turbine Pump SERIAL # AK3750

SIZE GPM FT. HEAD

RPM MANUFACTURER Fairbanks Morse

APPENDIX E.

. E. CHAPMAN COMPANY

TEST BORINGS · DRILLED WELLS · GRAVEL WELLS · COMPLETE WATER SYSTEMS

MAIN OFFICE:
OAKDALE, MASSACHUSETTS

TELEPHONES:
WEST BOYLSTON TEMPLE 5-3727 — 5-3221

August 27, 1957

Colonel Moyle
University of Connecticut
Maintenance Department
Storrs, Connecticut

Subj: Proposal for Gravel Packed Well

Dear Colonel Moyle:

Confirming our conversation relative to installing a 18" X 12" Gravel Packed Well; at the site of our #9 test well, which was completed in 1949.

D well

Our log shows #9 test hole to have gravel and sand all the way down to ledge at 59 feet. Our pump test shows a yield of 400 gallons per minute with an actual drawdown of 13 feet in the well, or approximately 30 gallons per foot of drawdown. We recommend installing an 18" X 12" Johnson Stabilized Gravel Packed Well, using 15 feet of 12" Everdur Metal Well Screen of the correct slot opening, of which we are enclosing a set of specifications to cover. We would expect a yield of 700 gallons per minute from this well when completed if this type of construction is used.

Item 1. Installation of a 59 foot deep, 18" X 12" diameter Gravel Packed Well with a 15 foot Everdur Metal Screen, completed ready for pump testing, for the lump sum price of $ 5,900.00.

Item 2. Furnish all labor and equipment and install a deep well turbine to run a 48 hour continuous pump test.
48 hours @ $ 7.00 per hour = $ 336.00.

Very truly yours,

R. E. CHAPMAN COMPANY

Richard W. Sullivan

Richard W. Sullivan
Treasurer

SPECIFICATIONS

For the Construction of a 12" Stabilized gravel-packed Well
in the "Gurleyville Section" of the Univ. of Conn., Storrs, Conn.

The Well is to be constructed at the location of a previously drilled test Well designated as Well #9 which showed the following conditions:

1. Course gravel from grade to approximately 10 feet below grade.
2. Course sand from 10 feet below grade to approximately 45 feet below grade.
3. Course gravel from 45 feet below grade to ledge at 59 ft. below grade.
4. A 2 inch observation well exists 8'-4" from test well #9 to a depth of 42 feet.
5. Test Well #9 is marked by a 2 inch pipe probably sunk to ledge at 59 feet.
6. No obstruction exists to movement of equipment to the location which is approximately 150 feet north of the Gurleyville Road.

This stabilized gravel-packed Well shall be constructed as follows:

Steel casing with minimum outside diameter of eighteen inches (18") shall be driven to a depth of approximately 59 feet.

A line of twelve-inch (12"), fifty-one pound (51#) black steel pipe, either threaded and coupled or welded, shall be run inside the eighteen-inch (18") casing, with suitable guides to center the twelve-inch (12") casing inside the outer casing. A 15 ft. Everdur Metal Well Screen, classified in the Edward E. Johnson Catalogue as twelve-inch (12") Telescope size, or equal, of correct length and slot opening, may be either (1) attached to the twelve-inch (12") well casing by a figure 4 Cone Fitting or set inside the twelve-inch (12") casing with a standard lead packer properly swedged to make a tight joint between casing and screen.

Well-rounded, graded, and screened gravel of correct sizes shall be introduced between the outer casing and the screen. As the outer casing is withdrawn, exposing the screen and gravel pack, the well shall be developed by simultaneous surging and pumping according to approved methods.

Development shall proceed until the screen is completely uncovered, and the Well takes no more gravel. When pumped at varying rates up to 700 gallons per minute, the water shall be free from sand at all times after the well is completely developed. Not more than a few sand grains shall be present in a gallon jug of water drawn from the discharge.

The well shall be sealed to prevent entrance of surface water through the gravel pack at a depth of 10 feet. This seal shall be made by leaving the top of gravel pack at the correct elevation, placing (concrete soupy grout of 1 part Lumnite cement and 2 parts sand) in this annular space to make a total depth of 20 feet of concrete. Space above the concrete shall be filled with impervious material and the outside casing withdrawn completely.

Well shall be completely installed and ready to operate on October 1, 1957

E-3

WELL D

R. E. CHAPMAN CO.

OAKDALE, MASS.

Name of Driller F. A. Sullivan Names of Helpers F. C. - J. K. Sullivan

Job: Name & Location UNIVERSITY OF CONN. STORS CONN

Date Started 11-28-57 Date Finished 12-7-57

Hole No.

Depth From	Depth To	Classification of Material	
0	20'	COARSE - GRAVEL	Feet of Screen Exposed 15' EVERDOUR
20	30	MEDUM - GRAVEL	Size of Screen & Slot 12" BOTTOM 10' - 100 TOP 5' 60
30	50	FINE - SAND	Screen Left in 15'
50	54'	MEDUM - SAND	CONE FITTING
54	59'	COARSE - SAND	Screen Pulled Out —
	59	BOTTOM.	Pipe Left in 44' - 6"
			Pipe Pulled Out ALL 18" PIPE
			Remarks

Date Started | Date Finished

Hole No.

Depth From	Depth To	Classification of Material	
			Feet of Screen Exposed
			Size of Screen & Slot
			Screen Left in
			Screen Pulled Out
			Pipe Left in
			Pipe Pulled Out
			Remarks

Pump Test on Hole No. | Pump Test on Hole No.

Date	Time	Dr. Down	G. P. M.	Static and Other Info.	Date	Time	Dr. Down	G. P. M.	Static and Other Info.
12-2-57	10-00AM	STATIC 9'-9" FROM TOP OF 12" PIPE ABOVVE GROUND 6"							
		D. D. 20'-9" PUMPING 300 G.P.M. FROM TOP OF PIPE							
		BOTTOM OF SCREEN SET 59' BELOW GROUND LEVEL							
		CEMENT SEAL FROM GROUND LEVEL DOWN TO 20' BELOW							

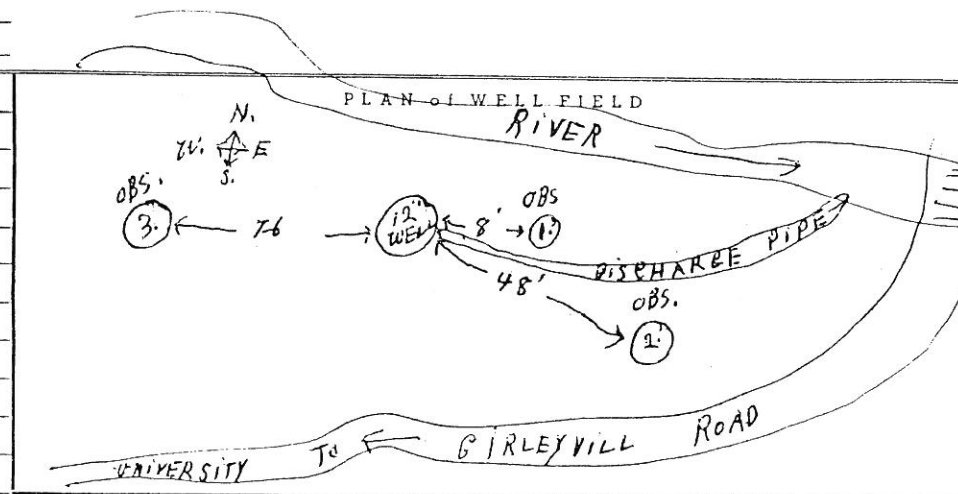
R. E. CHAPMAN CO. - LOG OF PUMP TEST ; PAGE, No. 1

...stomer UNIVERSITY OF CONN
...cation: 077 GIRLEYVILL ROAD AT NO. 9 TEST SITE
...wn STORS State CONN , Street ——

...ner of Property UNIVERSITY OF CONN.
...te 12 - 4 - 57
...erator F.Q. Sullivan F.G. Sullivan

Pump Data

...ze & Type of Pump 8" TURBIN
...ze & Length—Discharge Line 6" 360' To RIVER.
...ze Orifice Pipe in. 6"
...ze Orifice in. 6" X 5"
...scription of Well being pumped 18" X 12" GRAVEL PACK
...ngth Dunker in. (Do Not) Add To Readings END OF TAPE
...ngth of Alt. Line from center of gauge Ft. In. 40'



READINGS—Measurements From Top of Casing

WELL		LARGE WELL No. 3.		DIAM.	12"	LARGE WELL No.		DIAM.		Obs. Well No. 1.	Obs. Well No. 2.	Obs. Well No. 3.	Obs. Well No.	Obs. Well No.
Elevation—Top of Pipe Above Ground		Alt. Guage Reading	Corresponding Water Level	Head-In Inches	G. P. M.	Alt. Guage Reading	Corresponding Water Level	Head-In Inches	G. P. M.	1'-3"	1'-9"	1'-11"		
Date, Weather and Samples Taken	Time	Static	Static 10'	6 0	0 0	Static	Static			10'-2"	9'-10"	12'-10"		
12-4-57	7:00 AM		10'	0 0	0 0					10'-2"	9'-10"	12'-10"		
PUMP STARTED	8:00 AM		10'	18"	520					10'-2"	9'-10"	12'-10		
	8:30 AM		30'	18"	520					14'-3"	12'-4¼"	12'-7"		
	9:00 AM		30'	18"	520					14'-8	12'-8½	13'-10		
	10:00 AM		30'	18"	520					17'-0"	13'-2"	14'-5"		
	11:00 AM		30'	18"	520					17'-9"	13'-8½"	14'-11"		
NOON	12:00 AM		30'	18"	520					18'-2"	13'-11½"	15'-2"		
	1:00 PM		30'	18"	520					18'-4½"	14'-3"	15'-7"		
	2:00 PM		30'	18"	520					18'-7½"	14'-6½"	15'-10"		
	3:00 PM		30'-6"	18"	520					18'-11"	14'-10½"	16'-1½"		
CLOUDY	4:00 PM		30'-6"	18"	520					18'-11½"	15'-2"	16'-5"		
	5:00 PM		30'-6"	18"	520					19'-2"	15'-5"	16'-7½"		

E-5

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READINGS—Measurements From Top of Casing YES.   PAGE 2

WELL		LARGE WELL No. 3.		DIAM. 12"		LARGE WELL No. —		DIAM. —						
Date, Weather and Samples Taken	Time	Alt. Guage Reading	Corresponding Water Level	Head-In Inches	G. P. M.	Alt. Guage Reading	Corresponding Water Level	Head-In Inches	G. P. M.	Obs. Well No. 1.	Obs. Well No. 2	Obs. Well No. 3.	Obs. Well No.	Obs. Well No.
		Static	Static 10'	0 0	0 0	Static	Static			1'-3"	1'-9"	1'-11"		
12-4-57	6.00 P.M.		31'	18"	520					10'-2"	9'-10"	12'-10"		
	9-05 P.M.		32'-4"	18"	520					19'-5½"	15'-7½"	16'-9"		
	11-50 P.M.		33'-1½"	18"	520					20'-	16'-3"	17'-8"		
12-5-57	2-15 AM		34'-11"	18"	520					20'-4"	17'-11	18'-10½		
	5-20 AM		35'-1"	18"	520					21'-8"	18'-10¼	19'-4"		
CLEAR	7-00 AM		35'-1"	18"	520					22'-5	19'-7"	20'-9"		
	9-00 AM		35'-2"	18"	520					23'-1½	20'	21'		
NOON	11-00 AM		35'-6"	18"	520					23'-6"	20'-1"	21'-2"		
	1-00 P.M.		35'-6"	18"	520					25'	21'-2"	21'-9½"		
	3-00 P.M.		35'-6"	18"	520					25'-6"	21'-8½"	22'-3½"		
	5-00 P.M.		35'-6"	18"	520					26'-1½"	22'-5"	22'-10"		
	8-00 P.M		35'-9"	18"	520					26'-7	23'	23'-5"		
	11-10 P.M.		35'-9"	18"	520					27'-1"	23'-7¼"	24'-½"		
12-6-57	2-05 AM		36'	18"	520					27'-8"	24'-3¼"	24'-7"		
	4-50 AM		36'	18"	520					28'-1¼"	24'-10¼	25'-1"		
CLEAR.	6-00 AM		36'-6"	18"	520					28'-7"	25'-½"	25'-4¼"		
	7-00 AM		PUMPING		RATE	REDUCED		TO	400 G.P.M.	29'-	25'-4"	25'-10"		
	8-30 A.M.		36'-	11"	400					28'-9"	25'-8"	25'-6"		
	9-00 A.M.		36'-	11"	400					28'-9"	25'-1½"	25'-6½"		
NOON	11-00 AM		36'	11"	400					28'-8¾"	25'-1¼"	25'-6½"		
	1-00 PM		36'	11"	400					28'-8½"	25'-1"	25'-6¼"		
CLOUDY	3-00 P.M.		36'-	11"	400					28'-8½"	25'-1"	25'-6"		
	5-15 P.M.		35'-6"	11"	400					28'-7"	25'	25'-4"		
	8-30 P.M		35'-6	11"	400					28'-7	25'	25'-4"		
	11-30 P.M.		35'-6	11"	400					28'-7	24'-11½"	25'-3"		
12-7-57	2-10 AM		35'	11"	400					28'-6½"	24'-11"	25'-3¼"		
	4-00 AM		35'	11"	400					28'-6½"	24'-11"	25'-3"		

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READINGS—Measurements From Top of Casing YES. 1 of 3.

WELL		LARGE WELL No. 3.		DIAM.	12	LARGE WELL No.		DIAM.						
Date, Weather and Samples Taken	Time	Alt. Guage Reading	Corresponding Water Level	Head-In Inches	G. P. M.	Alt. Guage Reading	Corresponding Water Level	Head-In Inches	G. P. M.	Obs. Well No. 1.	Obs. Well No. 2.	Obs. Well No. 3.	Obs. Well No.	Obs. Well No.
										1'-3	1'-9'	1'-11"		
		Static	Static 10	00	00	Static	Static			10'-2"	9'-10"	12'-10"		
12-7-57	6-05 AM.		35'	11"	400					28'-6½"	24'-11"	25'-3"		
	7-30 AM.		35'	11"	400					28'-6½"	25'-11¼"	25'-3"		
72 HRS. →	8-30 AM.		35"	11"	400					28'-6¼"	25'-11"	25'-3"		
	8-30 AM.		PUMP	TEST	STOPED		RETURN	MEASURMENTS						
	8-35 AM.		27'-6"	00	00					18'-11	17'-4"	16'-1"		
	8-40 AM.		25'-	00	00					18'-3"	16'-1½"	15'-8"		
	9-15 AM.		20'-5"	00	00					14'-3½"	13'-7"	12'-6½"		

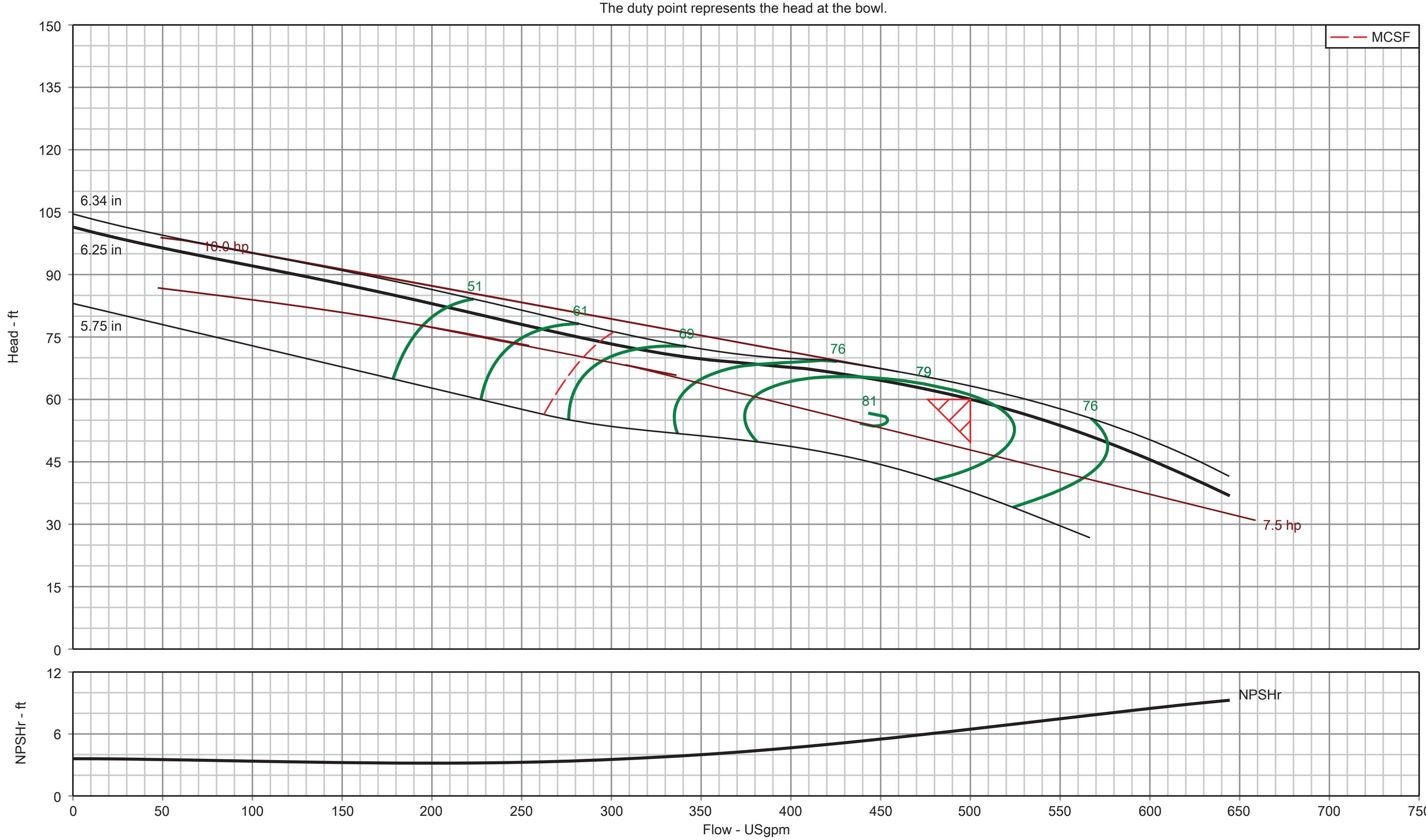
Customer :
Reference :

Pump Performance Curve

American-Marsh Pumps Quotation System 16.0.2.0

Wells B and C

Bowl performance. Adjusted for construction and viscosity.
The duty point represents the head at the bowl.



Item number	: 006	Size	: 8YS	Flow, rated	: 500.0 USgpm
Service	:	Stages	: 3	Differential head / pressure, rated	: 60.00 ft
Quantity	: 1	Speed, rated	: 1750 rpm	NPSH required	: 6.45 ft
Quote number	: 458140	Based on curve number	: 8YS	Fluid density, rated / max	: 1.000 / 1.000 SG
Date last saved	: 02 Mar 2016 2:42 PM	Efficiency (bowl / pump)	: 79.32 / - %	Viscosity	: 1.00 cP
		Power (bowl / pump)	: 9.55 / - hp	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00

Pump Data Sheet - Turbine 60 Hz

Company: xylem
Name:
Date: 3/3/2016

Customer:
Order No:

Powered By PUMP-FLO

Well D

Pump:

Size: 9RCLO (5 stage)

Type: Lineshaft
Synch speed: 1800 rpm
Speed: 1770 rpm
Dia: 6.6875 in

Curve: E6409CJPC1
Impeller:

Specific Speeds:
Ns: 2290
Nss: ---

Dimensions:
Suction: ---
Discharge: ---

Vertical Turbine:
Bowl size: 9.25 in
Max lateral: 0.88 in
Thrust K factor: 7 lb/ft

Pump Limits:

Temperature: 120 °F
Pressure: 400 psi g
Sphere size: 0.56 in
Power: ---
Eye area: ---

Search Criteria:

Flow: 500 US gpm
Head: 159 ft

Fluid:

Water
SG: 1
Viscosity: 0.9946 cP
NPSHa: ---
Temperature: 68 °F
Vapor pressure: 0.3391 psi a
Atm pressure: 14.7 psi a

Motor:

Standard: NEMA
Enclosure: TEFC
Size: 25 hp
Speed: 1800
Frame: 284T
Sizing criteria: Max Power on Design Curve

---- Data Point ----

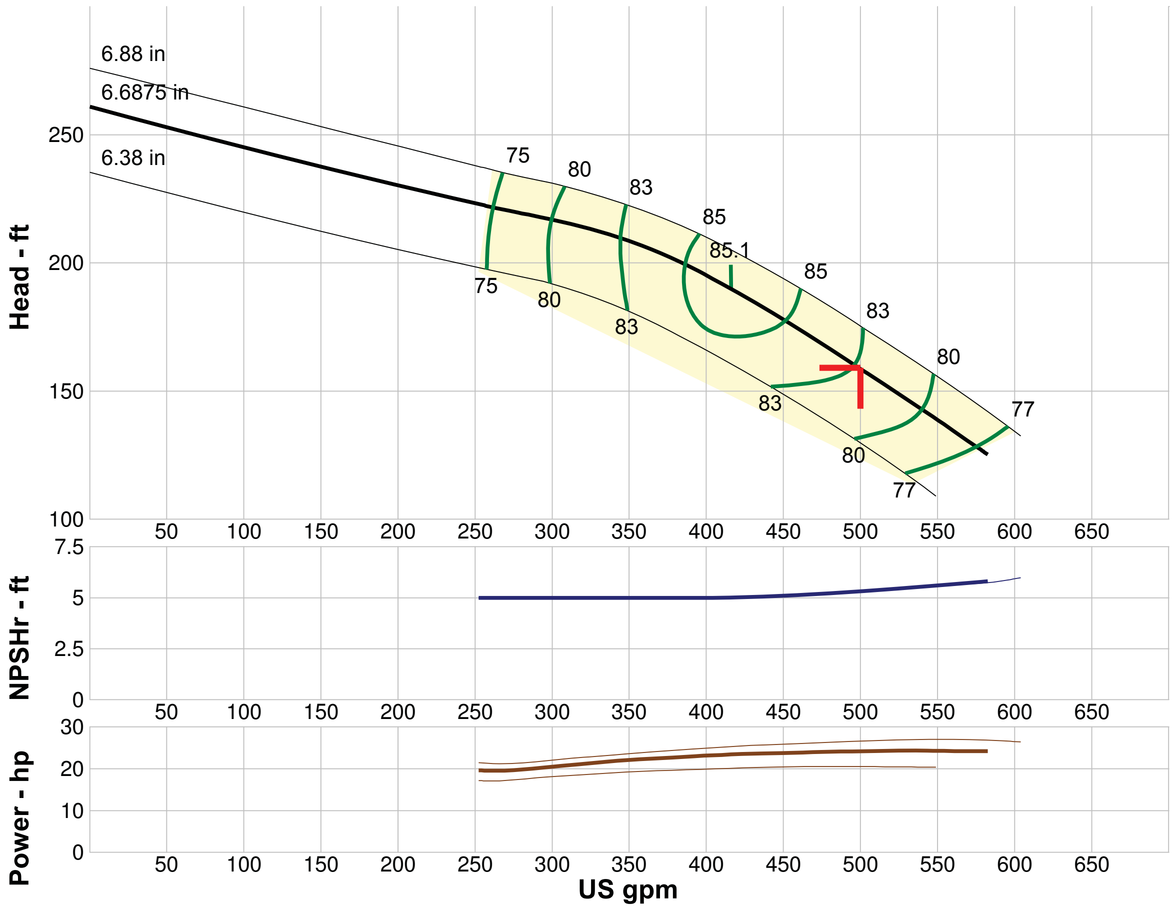
Flow:	500 US gpm
Head:	159 ft
Eff:	82.7%
Power:	24.2 hp
NPSHr:	5.32 ft

---- Design Curve ----

Shutoff head: 261 ft
Shutoff dP: 113 psi
Min flow: ---
BEP: 85.1% @ 416 US gpm
NOL power: 24.3 hp @ 540 US gpm

-- Max Curve --

Max power: 27.1 hp @ 547 US gpm



Curves are certified for water at 60°F only. Consult factory for performance with any other fluid.

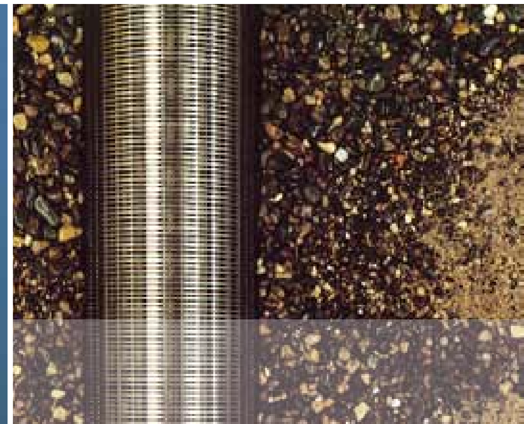
Performance Evaluation:

Flow US gpm	**Speed** rpm	**Head** ft	**Efficiency** %	**Power** hp	**NPSHr** ft
600	1770	---	---	---	---
500	1770	159	82.7	24.2	5.32
400	1770	195	85	23.1	5.01
300	1770	217	80	20.5	5
200	1770	---	---	---	---

APPENDIX D

Well Screen Specifications

STAINLESS STEEL WELL SCREENS & ACCESSORIES



Johnsonscreens®

THE WORLD'S BEST DESIGNED WATER WELLS USE JOHNSON SCREENS® WELL SCREENS AND ACCESSORIES

WHEN PERFORMANCE IS IMPORTANT - THERE IS NO EQUAL

Johnson Screens is the largest manufacturer of premium water well screens, bringing the best, most cost-efficient water wells to the industry.

BETTER WELL DEVELOPMENT

Johnson Screens® well screens have very high open area, allowing better access to the entire formation around the screen. Fines and drilling fluid are removed quickly and completely, resulting in better well development.

LOWER PUMPING COSTS

The high open area of a *Johnson Screens* well screen allows water to enter the well freely, resulting in minimal drawdown and less energy expended by the pump.

LESS MAINTENANCE

The continuous slot design allows lower entrance velocity of the water, which reduces encrustation rates. The slot design also resists plugging and prevents sand from damaging pumps.

CAREFUL DESIGN LEADS TO SUCCESSFUL SCREENS

- Johnson Screens will analyze the formation sand to correctly size the well screen
- A grade of steel with the right level of corrosion resistance is selected
- Noting the depth of the well, the correct combination of wire and rod that produces a screen with all the necessary strength characteristics is chosen
- The screen design is determined by aquifer characteristics and desired yield
- Johnson Screens can supply all of the fittings, welded or threaded, that best suits the method of installation

SAND CONTROL

The water well screen is a key component of sand-control systems, either as an integral component of the gravel pack, or as a stand-alone provider of sand control. *Johnson Screens* well screens, with patented Vee-Wire® technology and welded construction, help to prevent screen failure by better controlling the sand.

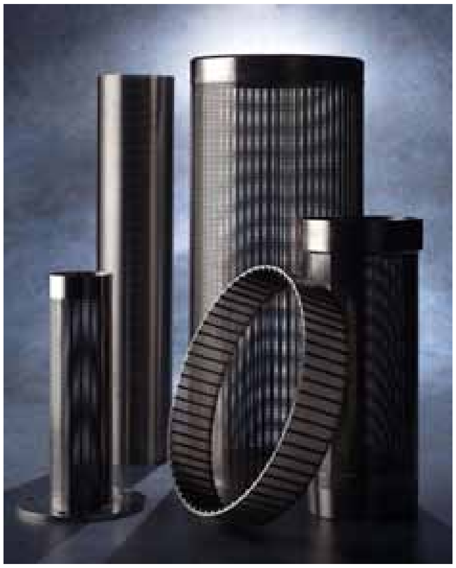
THE INDUSTRY'S BEST PRODUCT LINE COMES WITH THE INDUSTRY'S BEST SUPPORT

Johnson Screens does more than just make the world's best well screens; it also supplies technical support that is like having an in-house engineering team with no additional costs. Support services include:

- Sand analysis of formation materials
- Screen size recommendation
- Screen installation suggestions
- Well construction consultation

The Johnson Screens' staff includes design engineers, welders, technical support personnel and sales engineers who have been on the factory floor, presented in classrooms and technical seminars, set and pulled screens and run pumping tests.

Johnson Screens understands the water well world and is available to assist in any way.



JOHNSON SCREENS® END FITTING AND SCREEN CONNECTION OPTIONS

Most well screen installations involve a few standard fitting combinations. Telescope size screens typically use a Figure K packer on the screen top and a welded or threaded plate bottom. Pipe size screens attach directly to the casing and usually have plate bottoms.

Johnson Screens stocks a variety of other fittings, such as centralizers, shale traps and connecting fittings for quick delivery. Varieties include:

- Flush threads (Sch 40 and Sch 80)
- NPT thread
- Weld ring
- API couplers
- Plate bottom
- Threaded point
- Threaded cap/plug
- Locking cap
- Bail hooks
- Weld ring x weld ring
- Weld ring x collar
- PVC to stainless steel adaptor
- Quickloc™
- Shur-A-Lock®

Centralizer

Figure TF Washdown

Shale Trap

Figure K Packer

Wirelock Fittings

Drive Point

R & L Threaded Couplings

R & L Threaded Nipples

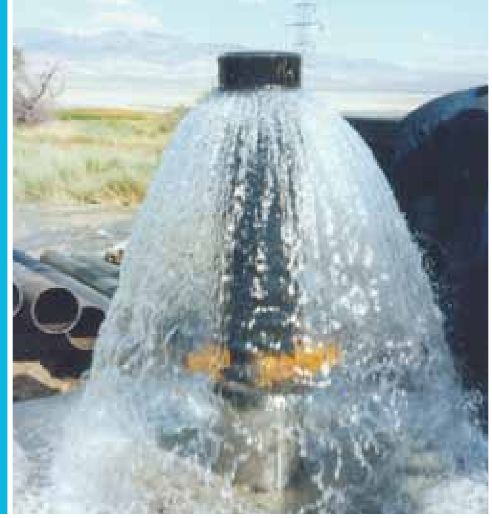
Back Pressure Valves

Wash Plugs

Di-Electric Coupling

Flush Thread

JOHNSON SCREENS: MORE THAN JUST SCREENS



DI-ELECTRIC COUPLING

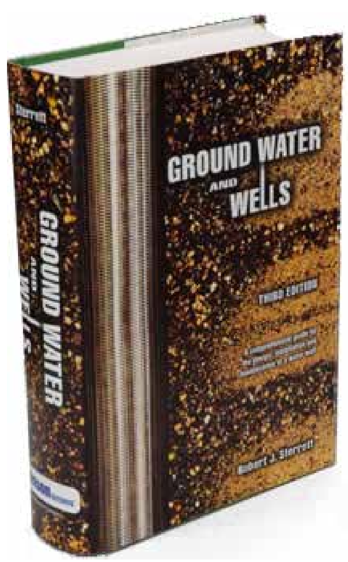
Johnson Screens® di-electric coupling prevents galvanic corrosion in municipal and industrial water well completions. When two dissimilar metals are coupled in water-saturated environments, the less corrosion-resistant metal corrodes faster from the galvanic cell created. This corrosion can be prevented by eliminating the contact between the two metal surfaces.

The di-electric coupling uses insulating rings which separate the metals and prevent contact. This feature increases the life of the pipe and, ultimately, the life of the well. Di-electric couplings are available for pipe sizes from 38 to 609 mm (1.5 - 24 In.). Special sizes or connection adaptors are available on request.

FEATURES, ADVANTAGES AND BENEFITS:

- In the center of the coupling, an insulating sleeve prevents dissimilar metals from making contact and causing corrosion of the casing. This feature greatly extends the life of the pipe for significant long-term savings
- The coupling has a small OD, only 38 to 51 mm (1.5 to 2 In. larger than that of the pipe. This feature saves costs by minimizing the size of the hole to be drilled
- The nominal ID of the string is maintained through the coupling for full design functionality

GROUNDWATER AND WELLS



Recognized worldwide by engineers and scientists as the authoritative text on hydro-geology, well hydraulics, design, construction and materials.

Johnson Screens recognizes the growing importance of environmental engineering.

Groundwater and Well's Third Edition includes comprehensive coverage of the accepted practices in environmental well management.

This book is a valuable tool for anyone who designs, specifies, drills, samples, manages, or interprets data from monitoring or recovery wells while complying with federal state and local laws. Groundwater and Wells Third Edition can be purchased from the Johnson Screens web site at www.johnsonscreens.com/book.

TECHNICAL INFORMATION: JOHNSON SCREENS® WATER WELL DRIVE POINTS

JOHNSON SCREENS 60 WIRE MODELS - 304 AND 316 STAINLESS STEEL

Size In.	OD: In.	ID: In.	Screen Weight[1]: lbs/ft	Max Depth: ft	Tensile Strength[2]: lbs	Column Strength[3]: lbs
1.25	1.7	1.0	2.0	1,000	5,500	5,800
2P	2.4	1.7	2.7	1,000	7,200	8,700
2P Sand Point	2.6	2.0	2.5	1,000	4,900	4,200
3P All Drive	3.7	3.0	4.4	1,000	12,700	13,400
4P All Drive	4.7	4.0	5.6	600	16,300	21,400
4P - Double Drive	4.8	4.0	7.0	1,000	16,300	21,400

Size In.	Open Area - In.^{2}/ft of Screen						Collapse Strength - PSI[4]					
	Screen Slot Size - Thousandths of an Inch						Screen Slot Size - Thousandths of an Inch					
	6	10	12	15	20	30	6	10	12	15	20	30
1.25	5.8	9.1	10.6	12.7	15.9	21.2	6,155	5,804	5,642	5,417	5,078	4,514
2P	8.2	12.8	15.0	17.9	22.4	29.9	2,349	2,215	2,153	2,067	1,938	1,722
2P Sand Point	8.9	14.0	16.3	19.6	24.5	32.6	1,825	1,721	1,673	1,606	1,506	1,338
3P All Drive	12.6	19.7	23.0	27.6	34.5	46.1	638	620	603	579	543	483
4P All Drive	16.0	25.2	29.4	35.3	44.1	58.8	318	300	291	280	262	233
4P - Double Drive	11.3	18.1	21.3	25.9	32.9	45.2	835	801	785	763	728	667

JOHNSON SCREENS 90 WIRE MODELS - 304 AND 316 STAINLESS STEEL

Size In.	OD: In.	ID: In.	Screen Weight[1]: lbs/ft	Max Depth: ft	Tensile Strength[2]: lbs	Column Strength[3]: lbs
1.25	1.7	1.0	1.7	600	5,500	5,800
2P	2.4	1.7	2.3	600	7,200	8,700
2P Sand Point	2.6	2.0	2.0	600	4,900	4,200
4P All Drive	4.6	4.0	4.8	250	16,300	21,400

Size In.	Open Area - In.^{2}/ft of Screen						Collapse Strength - PSI[4]					
	Screen Slot Size - Thousandths of an Inch						Screen Slot Size - Thousandths of an Inch					
	6	10	12	15	20	30	6	10	12	15	20	30
1.25	4.0	6.4	7.6	9.2	11.7	16.1	2,496	2,396	2,348	2,280	2,176	1,993
2P	5.7	9.1	10.7	12.9	16.5	22.6	857	822	806	782	747	684
2P Sand Point	5.9	9.5	11.1	13.5	17.2	23.7	743	713	699	679	648	594
4P All Drive	11.0	17.6	20.7	25.2	32.0	44.0	118	113	111	108	103	94

NOTES:

- Transmitting capacity (gpm/ft of screen) = open area x 0.31 @ 0.1 ft/sec
- P - pipe size

1. Weight is based on 10 slot construction, no fittings
2. Tensile and column strength includes 30 percent safety factor
3. Column strength is based on 5 ft screen barrel length
4. Calculated collapse values - no safety factor included

TECHNICAL INFORMATION: JOHNSON SCREENS® SMALL DIAMETER STAINLESS STEEL WELL SCREENS

JOHNSON SCREENS WATER WELL AND ENVIRONMENTAL SCREENS: 60 WIRE CONSTRUCTION - 304 AND 316 STAINLESS STEEL

Size In.	OD: In.	ID: In.	Screen Weight[1]: lbs/ft	Max Depth: ft	Tensile Strength[2]: lbs	Recom. Hang Weight[3]: lbs	Column Strength[4]: lbs
1.25	1.7	1.1	1.8	1,000	4,200	2,100	3,100
2P*	2.5	1.99**	1.9	1,000	2,000	1,000	1,500
2P/3T	2.6	2.0	2.2	1,000	3,400	1,700	2,600
2.5P	3.0	2.4	2.6	1,000	4,200	2,100	3,100
3P*	3.6	2.9	2.9	1,000	4,200	2,100	3,100
3P/4T	3.7	3.1	3.0	1,000	4,200	2,100	3,100
4P*	4.6	4.0**	3.7	600	4,800	2,400	3,700
4P/5T	4.7	4.1	3.8	600	4,800	2,400	3,700
5P/6T	5.6	5.0	4.5	400	5,600	2,800	4,200

Size In.	Open Area - In.²/ft of Screen							Collapse Strength - PSI						
	Screen Slot Size - Thousandths of an Inch							Screen Slot Size - Thousandths of an Inch						
	7	10	12	20	30	40	50	7	10	12	20	30	40	50
1.25	6.9	9.4	10.9	16.4	21.9	26.2	29.8	5,901	5,648	5,491	4,942	4,393	3,954	3,594
2P*	9.7	13.3	15.5	23.3	31.0	37.2	42.3	2,094	2,004	1,948	1,754	1,559	1,403	1,275
2P/3T	10.1	13.8	16.1	24.1	32.2	38.6	43.9	1,883	1,802	1,752	1,577	1,402	1,262	1,147
2.5P	11.9	16.2	18.9	28.4	37.8	45.4	51.6	1,164	1,114	1,083	975	867	780	709
3P*	14.0	19.1	22.3	33.5	44.6	53.5	60.8	713	682	663	597	531	478	434
3P/4T	14.5	19.9	23.2	34.8	46.4	55.6	63.2	635	608	591	532	473	426	387
4P*	17.9	24.5	28.6	42.9	57.2	68.6	78.0	340	326	317	285	253	228	207
4P/5T	18.6	25.4	29.6	44.4	59.2	71.0	80.7	307	294	286	257	229	206	187
5P/6T	22.1	30.2	35.2	52.9	70.5	84.6	96.1	182	174	170	153	136	122	111

NOTES:

- Transmitting capacity (gpm/ft of screen) = open area x 0.31 @ 0.1 ft/sec
- P - pipe size, T - telescope

1. Weight is based on 10 slot construction, no fittings
2. Tensile and column strength includes 30 percent safety factor
3. Recommended hang weight is 50 percent of calculated tensile strength
4. Column strength is based on 5 ft screen barrel length
5. Calculated collapse values - no safety factor included

* Alternate constructions for water well and environmental

** ID listed is confirmed clear for environmental

JOHNSON SCREENS® WATER WELL AND ENVIRONMENTAL SCREENS: 90 WIRE CONSTRUCTION - 304 AND 316 STAINLESS STEEL

Size	OD: In.	ID: In.	Screen Weight[1]: lbs/ft	Max Depth: ft	Tensile Strength[2]: lbs	Recom. Hang Weight[3]: lbs	Column Strength[4]: lbs
1.25	1.7	1.1	1.5	600	4,200	2,100	3,100
2P*	2.4	1.99**	1.5	600	2,000	1,000	1,500
2P/3T	2.5	2.0	1.7	600	3,400	1,700	2,600
2.5P	3.0	2.4	2.1	600	4,200	2,100	3,100
3P*	3.5	2.9	2.3	600	4,200	2,100	3,100
3P/4T	3.7	3.1	2.4	600	4,200	2,100	3,100
4P*	4.5	4.0**	2.9	250	4,800	2,400	3,700
4P/5T	4.7	4.1	3.0	250	4,800	2,400	3,700
5P/6T	5.6	5.0	3.5	100	5,600	2,800	4,200

Size	Open Area - In.²/ft of Screen							Collapse Strength - PSI						
	Screen Slot Size - Thousandths of an Inch							Screen Slot Size - Thousandths of an Inch						
	7	10	12	20	30	40	50	7	10	12	20	30	40	50
1.25	4.6	6.4	7.6	11.7	16.1	19.8	22.1	2,343	2,272	2,227	2,063	1,890	1,743	1,618
2P*	6.6	9.2	10.8	16.7	22.9	28.2	32.7	817	792	776	719	659	608	564
2P/3T	6.9	9.6	11.2	17.4	23.9	29.3	34.0	724	702	688	637	585	538	500
2.5P	8.1	11.3	13.3	20.5	28.1	34.6	40.1	443	429	421	390	357	330	306
3P*	9.6	13.3	15.7	24.2	33.3	40.9	47.5	269	261	255	237	217	200	186
3P/4T	10.0	13.9	16.3	25.2	34.6	42.6	49.4	239	232	227	211	193	178	165
4P*	12.4	17.1	20.2	31.1	42.8	52.6	61.0	127	123	121	112	102	94	88
4P/5T	12.8	17.7	20.9	32.2	44.3	54.5	63.2	114	111	109	101	92	85	79
5P/6T	15.3	21.2	24.9	38.5	52.8	65.0	75.4	67	65	64	59	54	50	47

NOTES:

- Transmitting capacity (gpm/ft of screen) = open area x 0.31 @ 0.1 ft/sec
- P - pipe size, T - telescope

1. Weight is based on 10 slot construction, no fittings
2. Tensile and column strength includes 30 percent safety factor
3. Recommended hang weight is 50 percent of calculated tensile strength
4. Column strength is based on 5 ft screen barrel length
5. Calculated collapse values - no safety factor included

* Alternate constructions for water well and environmental

** ID listed is confirmed clear for environmental

TECHNICAL INFORMATION: JOHNSON SCREENS® FREE-FLOW® 304 STAINLESS STEEL SCREENS

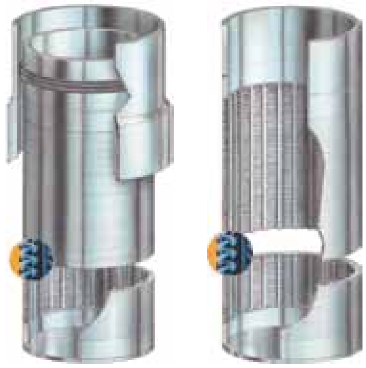
JOHNSON SCREENS LARGE DIAMETER *FREE-FLOW* SCREENS: SIZES 6P - 16T

Size In.	Max Depth: ft	OD: In.	ID: In.	Weight[1]: lbs/ft	Recom. Hang Weight[2]: lbs	Collapse Strength[1]: PSI	Intake Area[3] - In^2/ft of Screen							
							Screen Slot Size in Thousandths of an Inch							
							10	20	30	40	50	60	80	100
6" P	100	6.5	6.0	4.4	4,300	87	35	61	82	98	111	123	140	153
	250	6.6	6.0	4.8	4,300	194	20	37	51	64	75	85	102	115
	600	6.7	5.9	6.0	8,800	185	20	37	52	65	76	86	103	117
	1,000	6.8	5.9	7.6	8,800	677	16	30	43	54	64	73	89	103
8" T	250	7.6	6.7	7.0	11.000	127	23	42	59	73	86	98	117	133
	1,000	7.7	6.7	8.9	11,000	468	18	34	48	61	73	83	101	116
8" P	250	8.7	7.9	7.9	12,100	85	26	48	67	84	99	112	134	152
	1,000	8.8	7.9	10.1	20,800	314	21	39	55	70	83	95	115	133
10" T	250	9.5	8.6	8.3	12,100	65	28	53	74	92	108	122	146	166
	1,000	9.6	8.6	10.7	12,100	242	23	43	60	76	90	103	126	145
10" P	600	10.8	9.8	12.6	15,400	170	25	48	68	86	102	116	142	163
	1,000	10.8	9.8	17.8	15,400	226	25	48	68	86	102	116	142	163
12" T	600	11.4	10.4	13.6	17,600	145	27	51	72	90	107	123	149	172
	1,000	11.4	10.4	19.0	17,600	192	27	51	72	90	107	123	149	172
12" P	250	12.8	11.8	14.8	17.600	103	30	57	80	102	121	138	168	193
	600	12.8	11.8	20.9	17,600	136	30	57	80	102	121	138	168	193
	1,000	12.9	11.8	25.2	17,600	193	29	55	78	98	117	134	163	188
14" T	250	12.6	11.6	13.6	14,300	108	30	56	79	100	119	136	165	190
	600	12.6	11.6	19.6	14,300	143	30	56	79	100	119	136	165	190
	1,000	12.6	11.6	24.0	14,300	207	28	53	76	96	114	131	160	184
14" P / 16" T	250	14.1	13.1	15.5	17,100	77	33	63	89	112	133	152	185	213
	600	14.1	13.1	22.2	17,100	102	33	63	89	112	133	152	185	213
	1,000	14.1	13.1	27.2	17,100	148	32	60	85	107	128	146	179	206

NOTES:

- Screens are available in up to 40 foot lengths of continuously wrapped screen with no mid-weld
- 316 stainless steel screen technical information is available upon request
- P - pipe size, T - telescope

1. Based on 0.030 In. slot size (collapse values contain no safety factor)
2. Recommended hang weight is 50 percent of the calculated tensile strength
3. Transmitting capacity in gpm/ft of screen = open area x 0.31



Telescope size screens (left) install through the casing and usually have a Figure K packer as upper fitting. Pipe size screens (right) usually have weld rings at each end and attach directly to the casing.

JOHNSON SCREENS® LARGE DIAMETER FREE-FLOW® SCREENS: SIZES 16P - 36P

Size In.	Max Depth: ft	OD: In.	ID: In.	Weight[1]: lbs/ft	Recom. Hang Weight[2]: lbs	Collapse Strength[1]: PSI	Intake Area[3] - In^2/ft of Screen — Screen Slot Size in Thousandths of an Inch							
							10	20	30	40	50	60	80	100
16" P / 18" T	100	16.1	15.0	17.7	19,300	52	38	71	101	128	152	173	211	243
	250	16.1	15.0	25.4	19,300	69	38	71	101	128	152	173	211	243
	600	16.1	15.0	31.1	19,300	99	36	68	97	123	146	167	204	235
	1,000	16.1	14.8	39.5	43,800	168	40	75	106	133	158	180	219	251
18" P / 20" T	100	17.9	16.7	19.3	19,800	38	42	79	112	142	169	193	235	270
	250	17.9	16.7	34.0	19,800	72	40	76	108	136	162	186	227	262
	600	18.0	16.7	35.8	19,800	120	45	84	118	149	177	202	245	280
	1,000	18.0	16.7	42.7	37,100	120	45	84	118	149	177	202	245	280
20" P	100	19.9	18.8	21.8	23,100	27	47	88	125	158	188	214	261	300
	250	20.0	18.8	38.1	23,100	52	45	85	120	152	181	208	253	292
	600	20.1	18.8	40.3	23,100	87	50	94	132	167	197	225	273	313
	1,000	20.1	18.8	48.3	43,300	87	50	94	132	167	197	225	273	313
24" T	100	21.9	20.7	34.6	26,400	27	52	97	138	174	206	236	287	330
	250	21.9	20.7	42.2	26,400	40	49	93	132	167	198	227	278	320
	600	22.0	20.7	44.4	26,400	66	55	102	145	182	216	246	299	343
	1,000	22.2	20.7	66.7	49,500	145	42	80	114	146	174	201	248	289
24" P /26" T	100	24.1	22.8	44.8	22,000	30	54	102	145	184	218	250	305	352
	250	24.2	22.8	46.9	22,000	50	60	113	159	201	238	271	329	377
	1,000	24.4	22.8	69.0	41,200	110	46	88	125	160	192	221	273	317
26" P	100	25.7	24.4	47.5	23,700	25	58	109	155	196	233	267	326	376
	250	25.8	24.4	50.0	23,700	41	64	120	170	214	253	289	351	402
	1,000	26.0	24.4	73.7	44,300	91	49	93	134	170	204	235	290	338
30" T	100	27.0	25.8	49.7	23,700	21	61	114	162	206	245	280	342	395
	250	27.1	25.8	52.3	23,700	35	67	126	178	225	266	303	368	422
	1,000	27.3	25.8	73.7	44,300	78	51	98	140	179	214	247	305	355
30" P / 36" T	100	29.6	28.3	54.8	27,500	16	66	125	178	225	268	307	375	433
	250	29.7	28.3	57.6	27,500	27	74	138	195	246	292	333	403	463
	1,000	29.9	28.3	84.9	51,600	60	56	107	154	196	235	271	334	389
36" P	100	35.7	34.3	68.9	31,900	16	89	166	235	296	350	400	485	556
	600	35.9	34.3	101.2	59,800	35	68	129	185	235	282	325	401	467

NOTES:
- Screens are available in up to 40 foot lengths of continuously wrapped screen with no mid-weld
- 316 stainless steel screen technical information is available upon request
- P - pipe size, T - telescope

1. Based on 0.030 In. slot size (collapse values contain no safety factor)
2. Recommended hang weight is 50 percent of the calculated tensile strength
3. Transmitting capacity in gpm/ft of screen = open area x 0.31

TECHNICAL INFORMATION: JOHNSON SCREENS® HI-FLOW™ 304 STAINLESS STEEL SCREENS

JOHNSON SCREENS LARGE DIAMETER *HI-FLOW* SCREENS: SIZES 6P - 16T

Size In.	Max Depth: ft	OD: In.	ID: In.	Weight[1]: lbs/ft	Recom. Hang Weight[2]: lbs	Collapse Strength[1]: PSI	Intake Area[3] - In²/ft of Screen							
							Screen Slot Size in Thousandths of an Inch							
							10	20	30	40	50	60	80	100
6" P	100	6.5	6.0	4.4	4,300	87	35	61	82	98	111	123	140	153
	250	6.6	6.0	6.3	4,300	252	25	46	63	77	90	100	118	132
	600	6.7	5.9	7.5	8,800	241	26	46	64	78	91	102	120	134
	1,000	6.7	5.9	7.5	8,800	241	26	46	64	78	91	102	120	134
8" T	100	7.5	6.7	6.6	11,000	57	40	71	94	113	129	141	162	177
	600	7.5	6.7	8.7	11,000	172	29	52	71	88	102	114	134	150
	1,000	7.6	6.7	10.4	11,000	353	35	63	85	103	118	131	152	168
8" P	250	8.7	7.9	9.8	12,100	110	33	60	83	102	118	132	155	174
	1,000	8.7	7.9	11.8	12,100	236	40	72	97	118	136	150	174	192
10" T	250	9.5	8.6	10.5	12,100	85	36	66	90	111	129	144	170	189
	1,000	9.5	8.6	12.6	12,100	181	44	79	106	129	148	164	190	209
10" P	250	10.8	9.8	14.6	15,400	124	50	89	121	147	168	186	216	238
	1,000	10.9	9.8	21.0	15,400	341	29	55	77	97	114	130	157	179
12" T	250	11.3	10.4	15.8	17,600	108	53	94	127	154	176	195	226	249
	1,000	11.4	10.4	22.5	17,600	298	31	57	81	101	119	136	164	187
12" P	250	12.8	11.8	17.2	17,600	74	60	106	143	174	199	221	256	282
	1,000	12.9	11.8	24.7	17,600	206	35	65	91	114	135	154	185	211
14" T	250	12.5	11.6	16.0	14,300	80	58	104	140	170	195	216	250	276
	1,000	12.6	11.6	23.4	14,300	221	34	63	89	112	132	150	181	207
14" P / 16" T	250	14.0	13.1	18.2	17,100	57	65	116	157	190	218	242	280	309
	1,000	14.1	13.1	26.5	17,100	158	38	71	100	125	148	168	202	231

NOTES:

- Screens are available in up to 40 foot lengths of continuously wrapped screen with no mid-weld
- 316 stainless steel screen technical information is available upon request
- On average, Hi-Flow screens have a 30 percent higher open area
- P - pipe size, T - telescope

1. Based on 0.030 In. slot size (collapse values contain no safety factor)
2. Recommended hang weight is 50 percent of the calculated tensile strength
3. Transmitting capacity in gpm/ft of screen = open area x 0.31

JOHNSON SCREENS® LARGE DIAMETER HI-FLOW™ SCREENS: SIZES 16P - 36P

Size In.	Max Depth: ft	OD: In.	ID: In.	Weight[1]: lbs/ft	Recom. Hang Weight[2]: lbs	Collapse Strength[1]: PSI	Intake Area[3] - In^2/ft of Screen — Screen Slot Size in Thousandths of an Inch							
							10	20	30	40	50	60	80	100
16" P / 18" T	100	16.1	15.0	20.8	19,300	37	75	133	180	219	251	278	322	355
	600	16.1	15.0	30.3	19,300	106	43	81	111	143	169	192	231	264
	1,000	16.3	15.0	39.5	36,100	162	40	76	107	135	160	183	221	254
18" P / 20" T	600	17.9	16.7	33.4	19,800	78	48	90	127	159	187	213	257	293
	1,000	18.0	16.7	42.7	37,100	120	45	84	118	149	177	202	245	280
20" P	250	20.0	18.8	37.5	23,100	56	54	101	141	177	209	238	287	328
	600	20.1	18.8	40.1	23,100	87	50	94	132	167	197	225	273	313
	1,000	20.1	18.8	53.6	43,300	128	54	101	142	178	210	239	289	329
24" T	250	21.9	20.7	41.2	26,400	42	59	110	155	194	229	261	315	359
	600	22.0	20.7	44.4	26,400	66	55	102	145	182	216	246	299	343
	1,000	22.2	20.7	66.7	49,500	145	42	80	114	146	174	201	248	289
24" P /26" T	100	24.1	22.8	43.5	22,000	32	65	121	170	214	252	287	346	395
	250	24.2	22.8	46.9	22,000	50	60	113	159	201	238	271	329	377
	1,000	24.4	22.8	69.0	41,200	110	46	88	125	160	192	221	273	317
26" P	100	25.7	24.4	46.4	23,700	26	69	129	182	228	269	306	369	421
	250	25.8	24.4	50.0	23,700	41	64	120	170	214	253	289	351	402
	1,000	26.0	24.4	73.7	44,300	91	49	93	134	170	204	235	290	338
30" T	100	27.0	25.8	48.5	23,700	23	73	136	191	240	283	321	388	443
	250	27.1	25.8	52.3	23,700	35	67	126	178	225	266	303	368	422
	1,000	27.3	25.8	76.7	44,300	78	51	98	140	179	214	247	305	355
30" P / 36" T	100	29.6	28.3	53.5	27,500	17	80	149	209	263	310	352	425	485
	250	29.7	28.3	57.6	27,500	27	74	138	195	246	292	333	403	463
	1,000	29.9	28.3	84.9	51,600	60	56	107	154	196	235	271	334	389
36" P	100	35.7	35.7	68.9	31,900	16	89	166	235	296	350	400	485	556
	250	35.8	35.8	89.7	59,800	23	96	180	253	318	375	426	514	587
	600	35.9	34.3	101.2	59,800	35	68	129	185	235	282	325	401	467

NOTES:

- Screens are available in up to 40 foot lengths of continuously wrapped screen with no mid-weld
- 316 stainless steel screen technical information is available upon request
- On average, Hi-Flow screens have a 30 percent higher open area
- P - pipe size, T - telescope

1. Based on 0.030 In. slot size (collapse values contain no safety factor)
2. Recommended hang weight is 50 percent of the calculated tensile strength
3. Transmitting capacity in gpm/ft of screen = open area x 0.31

TECHNICAL INFORMATION: JOHNSON SCREENS® HICAP™ HIGH CAPACITY LOW CARBON STEEL SCREENS

JOHNSON SCREENS LARGE DIAMETER *HICAP* SCREENS: SIZES 6P -18T

Size In.	Max Depth: ft	OD: In.	ID: In.	Weight[1]: lbs/ft	Recom. Hang Weight[2]: lbs	Collapse Strength[1]: PSI	Intake Area[3] - In^2/ft of Screen					
							Screen Slot Size in Thousandths of an Inch					
							30	40	50	60	80	100
6" P	250 1,000	6.6 6.9	6.0 5.9	6.3 15.5	5,100 14,500	266 1,855	63 30	77 39	90 47	100 54	118 67	132 79
8" T	250 1,000	7.5 7.7	6.7 6.7	8.7 17.9	12,900 18,100	182 1,340	71 34	88 43	102 52	114 60	134 75	150 88
8" P	250 1,000	8.7 8.9	7.9 7.9	9.9 20.3	14,100 19,900	117 871	83 39	102 50	118 60	132 70	155 87	174 102
10" T	250 1,000	9.5 9.7	8.6 8.6	11.1 22.6	16,700 23,600	90 674	90 42	111 54	129 66	144 76	170 95	189 111
10" P	250 600 1,000	10.9 10.9 10.9	9.8 9.8 9.8	25.2 25.2 25.2	25,400 25,400 25,400	476 476 476	48 48 48	61 61 61	74 74 74	85 85 85	106 106 106	125 125 125
12" T	250 600 1,000	10.9 10.9 10.9	9.8 9.8 9.8	27.1 27.1 27.1	29,000 29,000 29,000	476 476 476	48 48 48	61 61 61	74 74 74	85 85 85	106 106 106	125 125 125
12" P	250 600 1,000	12.9 12.9 13.0	11.8 11.8 11.8	29.5 31.2 34.3	29,000 29,000 29,000	288 333 502	56 68 60	72 86 76	87 103 92	101 119 106	126 147 132	148 171 155
14" T	250 600 1,000	12.6 12.6 12.6	11.5 11.5 11.5	27.5 27.5 29.1	23,600 23,600 23,600	309 309 357	55 55 66	71 71 84	85 85 101	99 99 116	123 123 143	144 144 167
14" P / 16" T	250 600 1,000	14.1 14.1 14.1	13.0 13.0 13.0	31.3 31.3 33.1	28,100 28,100 28,100	221 221 255	62 62 74	79 79 94	95 95 113	110 110 130	138 138 160	162 162 187
16" P / 18" T	250 600 1,000	16.0 16.0 16.0	14.8 14.8 14.8	35.5 35.5 37.7	31,700 31,700 31,700	152 152 175	70 70 84	90 90 107	108 108 128	125 125 148	156 156 182	183 183 212

NOTES:

- Screens are available in up to 40 foot lengths of continuously wrapped screen with no mid-weld
- P - pipe size, T - telescope

1. Based on 0.030 In. slot size (collapse values contain no safety factor)
2. Recommended hang weight is 50 percent of the calculated tensile strength
3. Transmitting capacity in gpm/ft of screen = open area x 0.31

JOHNSON SCREENS® LARGE DIAMETER HICAP™ SCREENS: SIZES 18P - 36P

Size In.	Max Depth: ft	OD: In.	ID: In.	Weight[1]: lbs/ft	Recom. Hang Weight[2]: lbs	Collapse Strength[1]: PSI	Intake Area[3] - In²/ft of Screen Screen Slot Size in Thousandths of an Inch: 30	40	50	60	80	100
18" P / 20" T	250 600 1,000	17.9 17.9 18.0	16.7 16.7 16.7	39.0 41.5 46.1	32,600 32,600 32,600	108 125 190	78 94 82	100 120 106	121 144 127	140 165 147	175 204 183	205 237 214
20" P	250 600 1,000	20.0 20.0 20.1	18.8 18.8 18.8	44.0 46.7 51.9	38,100 38,100 38,100	78 90 137	87 105 92	112 134 118	135 160 142	157 185 164	195 228 204	229 265 239
24" T	250 600 1,000	21.9 21.9 22.0	20.7 20.7 20.7	48.7 51.7 57.4	43,500 43,500 43,500	59 68 104	96 115 101	123 147 129	148 176 155	171 202 180	214 249 223	251 290 262
24" P /26" T	100 250 600 1,000	24.2 24.2 24.3 24.4	22.8 22.8 22.8 22.8	53.8 57.1 63.2 74.6	48,100 48,100 48,100 48,100	44 51 78 124	106 127 111 149	136 162 143 189	163 194 172 224	189 223 198 257	236 275 247 313	277 320 289 361
26" P	100 250 600 1,000	25.8 25.8 25.9 26.0	24.4 24.4 24.4 24.4	57.5 61.0 67.6 79.7	51,700 51,700 51,700 51,700	36 42 64 102	113 136 119 159	145 173 152 201	174 207 183 239	202 238 211 274	252 294 263 334	296 341 308 384
30" T	100 250 600 1,000	27.1 27.1 27.2 27.3	25.8 25.8 25.8 25.8	59.8 63.5 70.3 83.1	51,700 51,700 51,700 51,700	31 36 55 88	118 143 125 167	152 182 160 211	183 217 192 251	212 250 222 287	265 308 276 350	311 358 323 404
30" P / 36" T	250 600	29.7 29.9	28.3 28.3	70.4 91.6	60,100 60,100	28 67	156 183	199 211	238 275	274 315	338 384	393 442
36" P	100 250 600	100 250 600	35.7 35.8 35.9	34.3 34.3 34.3	83.9 92.9 109.3	69,800 69,800 69,800	16 24 39	188 164 219	239 210 278	286 292 378	406 364 461	472 426 531

NOTES:

- Screens are available in up to 40 foot lengths of continuously wrapped screen with no mid-weld
- P - pipe size, T - telescope

1. Based on 0.030 In. slot size (collapse values contain no safety factor)
2. Recommended hang weight is 50 percent of the calculated tensile strength
3. Transmitting capacity in gpm/ft of screen = open area x 0.31

TECHNICAL INFORMATION: JOHNSON SCREENS® HICAP™ HIGH CAPACITY LOW CARBON STEEL GALVANIZED SCREENS

JOHNSON SCREENS LARGE DIAMETER *HICAP* SCREENS: SIZES 6P - 16T

Size In.	Max Depth: ft	OD: In.	ID: In.	Weight[1]: lbs/ft	Recom. Hang Weight[2]: lbs	Collapse Strength[1]: PSI	Intake Area[3] - In^2/ft of Screen — Screen Slot Size in Thousandths of an Inch							
							10	20	30	40	50	60	80	100
6" P	250	6.6	6.0	6.3	5,100	266	25	46	63	77	90	100	118	132
	1,000	6.6	5.9	7.9	9,600	266	25	46	63	77	90	100	118	132
8" T	600	7.5	6.7	9.2	12,100	182	29	52	71	88	102	114	134	150
	1,000	7.7	6.7	16.6	24,100	573	19	37	52	65	77	88	106	121
8" P	250	8.6	7.9	10.4	13,300	121	33	59	82	101	117	131	153	172
	600	8.7	7.9	14.9	13,300	399	22	41	58	73	87	99	120	137
	1,000	8.8	7.9	18.8	26,500	385	22	42	59	74	88	100	121	139
10" T	250	9.3	8.6	11.7	19,000	96	35	64	88	109	126	141	166	186
	600	9.5	8.6	16.6	15,700	307	24	45	64	80	95	108	131	150
	1,000	9.6	8.6	21.1	31,300	297	24	46	64	81	96	109	132	151
10" P	100	10.6	9.8	13.0	16,800	65	40	73	101	124	144	161	189	211
	600	10.7	9.8	18.5	16,800	215	27	51	72	90	107	122	147	169
	1,000	10.8	9.8	23.3	33,600	209	27	51	72	91	108	123	149	170
12" T	100	11.2	10.4	14.1	19,300	55	43	77	106	131	152	170	200	223
	600	11.2	10.4	14.1	19,300	55	43	77	106	131	152	170	200	223
	1,000	11.4	10.4	25.4	38,500	178	29	54	76	96	114	130	157	180
12" P	100	12.6	11.8	15.2	19,300	39	48	87	120	147	171	191	225	251
	600	12.7	11.8	21.7	19,300	129	32	60	85	107	127	144	175	200
	1,000	12.8	11.8	27.2	38,500	126	32	61	86	108	128	145	176	202
14" T	100	12.3	11.6	14.0	15,700	42	47	85	117	144	167	187	220	245
	600	12.5	11.6	20.3	15,700	135	32	59	84	105	125	142	172	197
	1,000	12.7	11.6	31.7	31,300	348	25	47	67	85	102	117	145	168
14" P / 16" T	250	14.0	13.1	23.1	18,700	96	35	66	94	118	140	159	193	221
	600	14.1	13.1	30.6	18,700	255	27	52	74	94	113	130	160	187
	1,000	14.2	13.0	36.1	37,300	250	27	52	75	95	114	131	162	188

NOTES:

- Screens are available in up to 40 foot lengths of continuously wrapped screen with no mid-weld
- P - pipe size, T - telescope

1. Based on 0.030 In. slot size (collapse values contain no safety factor)
2. Recommended hang weight is 50 percent of the calculated tensile strength
3. Transmitting capacity in gpm/ft of screen = open area x 0.31

JOHNSON SCREENS® LARGE DIAMETER HICAP™ SCREENS: SIZES 16P - 36P

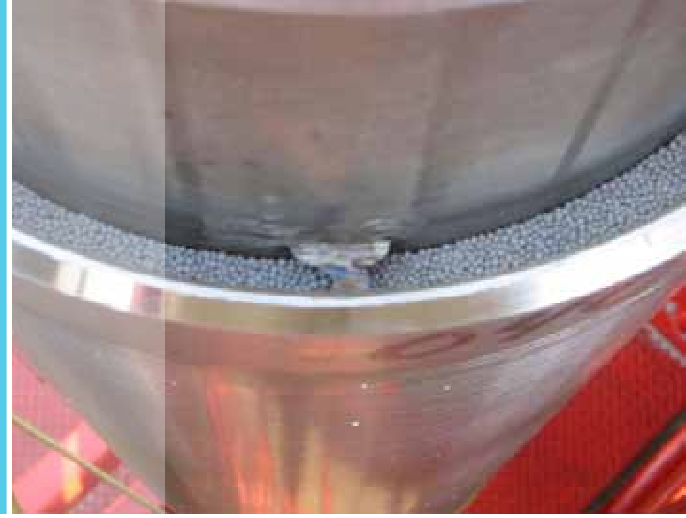
Size In.	Max Depth: ft	OD: In.	ID: In.	Weight[1]: lbs/ft	Recom. Hang Weight[2]: lbs	Collapse Strength[1]: PSI	Intake Area[3] - In²/ft of Screen — Screen Slot Size in Thousandths of an Inch: 10	20	30	40	50	60	80	100
16” P / 18” T	250	16.0	15.0	26.4	21,100	65	40	76	107	135	160	182	220	252
	600	16.2	15.0	35.1	21,100	169	31	60	85	109	130	150	184	214
	1,000	16.1	14.8	40.9	42,100	172	31	59	85	108	129	149	183	213
18” P / 20” T	100	17.8	16.7	28.8	21,700	47	45	84	119	150	178	202	245	281
	600	17.9	16.7	35.1	21,700	125	35	66	94	120	144	165	204	237
	1,000	18.0	16.7	40.9	43,300	123	35	66	95	121	144	166	205	238
20” P	100	19.8	18.8	32.5	25,300	34	50	94	133	167	197	225	273	312
	600	20.0	18.8	43.1	25,300	90	39	74	105	134	160	185	228	265
24” T	100	21.8	20.7	35.9	28,900	26	55	103	146	184	217	248	300	344
	600	21.9	20.7	47.6	28,900	68	42	81	155	147	176	202	249	290
24” P /26” T	250	24.2	22.8	57.1	48,100	51	47	89	127	162	194	223	275	320
26” P	250	25.8	24.4	61.0	51,700	42	50	100	143	173	207	238	294	341
30” T	250	27.2	25.8	63.5	51,700	36	52	100	143	182	217	250	308	358
30” P / 36” T	250	29.7	28.3	70.4	60,100	28	57	109	156	199	238	274	338	393

NOTES:

- Screens are available in up to 40 foot lengths of continuously wrapped screen with no mid-weld
- P - pipe size, T - telescope

1. Based on 0.030 In. slot size (collapse values contain no safety factor)
2. Recommended hang weight is 50 percent of the calculated tensile strength
3. Transmitting capacity in gpm/ft of screen = open area x 0.31

TECHNICAL INFORMATION: JOHNSON SCREENS® MUNI-PAK™ PRE-PACKED WELL SCREENS



JOHNSON SCREENS MUNI-PAK SCREENS

Muni-Pak screens are pre-packed, providing numerous features and advantages for the contractor and well owner. A smaller borehole, stronger construction, thinner filter pack and maximized open area all combine to produce a time, money and energy saving well screen.

SPECIFICATIONS

Size[1] In.	Approx. Screen ID In.	Approx. Screen OD In.	Media Annular Thickness In.	Inner Screen Open Area - In.^{2}/ft of Screen; Screen Slot Size in Thousandths of an Inch							Outer Screen Open Area - In.^{2}/ft of Screen; Screen Slot Size in Thousandths of an Inch							Approx. Screen Weight lbs/ft
				8	12	20	25	30	40	50	8	12	20	25	30	40	50	
2 x 4	2.2	4.5	0.85	11	15	22	26	30	36	41	20	28	42	50	57	68	77	17
3 x 5	3.0	5.7	0.97	16	22	33	39	44	53	60	25	36	54	63	72	86	98	23
4 x 6	4.0	6.7	0.94	20	28	42	50	57	68	77	30	42	63	74	84	101	115	25
5 x 7	5.0	7.7	0.87	25	35	53	62	71	85	96	34	48	73	85	97	116	132	27
6 x 8	6.0	8.7	0.84	20	29	45	54	62	77	89	27	39	60	71	82	101	117	35
8 x 10	8.0	10.8	0.84	27	38	59	71	81	100	116	33	48	74	89	102	125	145	55
10 x 12	10.0	12.8	0.84	26	38	60	72	83	104	122	31	45	71	86	99	124	145	70
12 x 15	12.0	15.0	0.84	31	45	71	85	99	123	145	36	53	83	100	116	145	170	85
14 x 16	13.2	16.0	0.64	36	52	81	98	113	141	165	41	59	93	112	129	161	188	100
16 x 18	15.2	18.0	0.64	41	59	93	112	129	161	188	46	67	104	126	145	181	212	115
18 x 20	17.0	20.0	0.78	39	57	90	109	127	160	188	44	64	101	122	141	177	209	128

MUNI-PAK SCREEN VS. STANDARD ROD BASED SCREEN

Nominal Size[2] (In.)		Collapse Strength (PSI)		Tensile Strength (PSI)	
Rod Based	*Muni-Pak*	Rod Based	*Muni-Pak*	Rod Based	*Muni-Pak*
2	2 x 4	1,940	16,500	4,300	12,500
3	3 x 5	540	5,650	5,200	15,000
4	4 x 6	730	2,830	6,100	18,800
5	5 x 7	440	1,550	7,000	20,700
6	6 x 8	260	990	17,600	41,600
8	8 x 10	250	1,160	24,200	50,000
10	10 x 12	360	630	30,800	81,400
12	12 x 15	220	880	35,200	87,000
14	14 x 16	170	1,110	35,200	95,400
16	16 x 18	170	760	72,200	135,900
18	18 x 20	130	540	74,200	147,200

STANDARD FILTER PACK SIZES

Slot Size In.	Carbolite Size	Filter Pack
0.008	n/a	40/60
0.012	20/40	20/40
0.020	16/20	16/30
0.025	n/a	10/20
0.030	12/18	n/a
0.040	8/14	8/12
0.050	6/12	n/a

NOTES:

1. Other sizes available upon request
2. Values compare 1,000 ft of *Muni-Pak* vs 1,000 ft of rod based screen

TECHNICAL INFORMATION: JOHNSON SCREENS® PIPE BASED WELL SCREENS

JOHNSON SCREENS PIPE BASED WELL SCREENS

Pipe based well screens combine the hydraulic efficiency of wire-wound screens with the great strength of pipe. Because of the strength of the pipe liner, the wrap wires can be smaller, which produces greater open area.

The longitudinal support rods on the screen jacket create channels which direct incoming flow to the nearest pipe perforation. Screen and pipe are welded to make a rugged, reliable unit suitable for deep vertical wells, as well as horizontal remediation and supply wells.

JOHNSON SCREENS STAINLESS STEEL PIPE BASED WELL SCREENS

Size In.	Pipe OD In.	Pipe Open Area Per Foot In.^{2}	Screen OD In.	Approx. Weight lbs	Open Area - In²/ft of Screen				
					Screen Slot Size in Thousandths of an Inch				
					10	15	20	25	30
1.5	1.90	7.95	2.40	4	9.0	12.9	16.5	19.7	22.6
2.0	2.38	9.28	2.90	5	10.9	15.6	19.9	23.8	27.3
2.5	2.88	10.60	3.40	7	12.8	18.3	23.3	27.9	32.0
3.0	3.50	11.93	4.00	10	15.1	21.5	27.4	32.8	37.7
4.0	4.50	28.27	5.00	14	18.8	26.9	34.3	41.0	47.1
5.0	5.56	35.34	6.10	17	23.0	32.9	41.8	50.0	57.5
6.0	6.63	40.06	7.10	24	26.8	38.2	48.7	58.2	66.9
7.0	7.00	37.70	7.50	35	28.3	40.4	51.4	61.5	70.7
7.625	7.63	42.41	8.10	44	30.5	43.6	55.5	66.4	76.3
8	8.63	49.48	9.10	38	34.3	49.0	62.4	74.6	85.8
9.625	9.63	49.48	10.10	41	38.1	54.4	69.2	82.8	95.2
10.0	10.75	56.55	11.30	49	42.6	60.9	77.5	92.6	106.5
12.0	12.75	65.97	12.30	60	46.8	66.9	85.1	101.7	116.9
14.0	14.00	70.69	14.50	69	55.2	78.8	100.3	119.9	137.8
16.0	16.00	75.40	16.50	78	62.8	89.7	114.1	136.4	156.8
18.0	18.00	84.82	18.50	85	70.4	100.6	128.0	152.9	175.8

NOTES:

- Weight is based on standard wall pipe, except for 7.625 In.

TECHNICAL INFORMATION: JOHNSON SCREENS® CASINGS

JOHNSON SCREENS OFFERS A VARIETY OF CASINGS TO SUIT MANY WELL APPLICATIONS

COMMON 304 STAINLESS STEEL CASINGS

Pipe Size Nom. Diam. In.	Sch.	OD In.	ID In.	Weight Per ft	Collapse Strength PSI
1.0	5 10 40	1.315	1.185 1.097 1.049	0.88 1.42 1.70	2,445
1.25	5 10 40	1.660	1.530 1.442 1.380	1.12 1.82 2.29	1,362 3,271 4,736
1.5	5 10 40	1.900	1,770 1,682 1,610	1.29 2.10 2.74	1,074 2,704 4,177
2.0	5 10 40	2.375	2.245 2.157 2.067	1.62 2.66 3.69	650 1,824 3.208
3.0	5 10 40	3.500	3.334 3.260 3.068	3.06 4.37 7.65	468 1,050 2,972
4.0	5 10 40	4.500	4.334 4.260 4.026	3.95 5.67 10.90	253 614 2,303
5.0	5 10 40	5.563	5.345 2.295 5.047	6.41 7.84 14.75	295 486 1,854
6.0	5 10 40	6.625	6.407 6.357 6.065	7.66 9.38 19.15	189 319 1,570
8.0	10 40	8.625	8.329 7.981	13.53 28.82	210 1,243
10.0	10 40	10.750	10.420 10.020	18.83 40.86	157 1,030
12.0	10 0.375*	12.750	12.390 12.000	24.39 50.03	126 762

* Standard wall

COMMON SCH 40 LOW CARBON STEEL CASINGS

Pipe Size Nom. Diam. In.	OD In.	ID In.	Weight Per ft	Collapse Strength PSI
1.0	1.315	1.049	1.68	6,127
1.25	1.660	1,380	2.27	4,743
1.5	1.900	1,610	2.72	4,185
2.0	2.375	2.067	3.65	3,219
3.0	3.500	3.068	7.58	2,983
4.0	4.500	4.026	10.79	2,316
5.0	5.563	5.047	14.62	1,869
6.0	6.625	6.065	18.97	1,585
8.0	8.625	7.981	28.55	1,259
10.0	10.750	10.020	40.48	1,045
12.0*	12.750	12.000	49.56	776

FORMAT FOR SPECIFYING JOHNSON SCREENS

WELL SCREENS

GENERAL: Well screens shall be of the continuous slot design to provide maximum open area, to reduce entrance velocity, increase hydraulic efficiency and promote more effective development. The well screens shall be constructed out of Vee-Wire® trapezoidal wire, continuously wrapped around an array of equally spaced support rods of the same material. Each junction of wire/rod contact shall be resistance welded. The screens and end fittings shall be made of _________ (material). The well screens shall be manufactured by Johnson Screens, or approved equal.

COLLAPSE STRENGTH: Well screens to be _____ inches OD, continuous slot wire-wrapped _________ (material), designed to withstand a minimum collapse pressure of _____ psi for a _____ inch slot opening. The surface wire shape shall cause the slot opening to widen inwardly to minimize clogging. Surface wrap-wire height shall be _____ inch to provide the desired collapse strength. The wrap-wire face width shall be of minimum dimensions to provide _____ percent open area at the anticipated _____ inch slot opening.

TENSILE STRENGTH: The minimum screen tensile strength must exceed at least twice the total weight of the screen and any standard wall blank casing suspended below the top screen joint. The tensile strength shall be a minimum of _____ pounds. (Tensile strength is total rod area times material yield strength).

SCREEN CONFIGURATION: Screens shall be manufactured in various lengths complete with _________ (material) weld rings attached to each end. The weld rings shall be standard available lengths as requested by the contractor and approved by the engineer.

SCREEN SUBMITTALS

Upon request, the screen manufacturer shall provide a submittal and schematic drawing of the proposed screen design. The documents shall include the OD, ID, construction materials, slot size, approximate weight per foot, wrap wire length, wrap wire height, collapse strength, percent open area, inlet open area per foot, transmitting capacity per foot, number of support rods, diameter of support rods, total cross sectional rod area, material yield strength, tensile strength, column load and recommended hang weight.

MUNI-PAK™ SCREENS

GENERAL: *Muni-Pak* screens shall be of the continuous slot design to provide maximum open area, to reduce entrance velocity, increase hydraulic efficiency and promote more effective development. Both the inner and outer screens shall be constructed out of Vee-Wire® trapezoidal wire, continuously wrapped around an array of equally spaced support rods of the same material. Each junction of wire/rod contact shall be resistance welded. The screens and end fittings shall be made of _________ (material).The well screens shall be manufactured by Johnson Screens, or approved equal.

DIAMETER: The *Muni-Pak* screen shall be _____ inch pipe size inner screen by _____ inch pipe size outer screen.

COLLAPSE: The dual screen assembly shall be manufactured with a wrap wire designed to yield a minimum collapse pressure of _____ psi at a design slot opening of _____ inches. The wire shape shall cause the slot opening to widen inwardly to minimize clogging.

OPEN AREA: The inner screen shall provide _____ square inches of inlet area per foot of screen at the design slot size. The outer screen shall be of the same slot as the inner screen. The slot size and filter pack are to be selected on the basis of a sieve analysis of the water bearing formation.

FILTER PACK: The annulus between screens shall be filled with ceramic or glass beads of uniform size and excellent sphericity. The pack size shall be _____ filter size. The pack material shall be installed and compacted by vibrating the unit in a vertical position, while being filled. The top and bottom filter seal plates shall be secured by welding.

TENSILE STRENGTH: The minimum screen tensile strength must exceed at least twice the total hang weight of the screen and blank casing below the top screen joint. The tensile strength shall be a minimum of _____ pounds. (Tensile strength is total rod area times material yield strength).

SCREEN CONFIGURATION: Screens shall be manufactured in various lengths with a maximum of 40 feet length overall. Screens shall be complete with _________ (material) and fittings attached to each end. Standard weld rings are six inches. Weld rings of longer lengths, or threaded fittings may be requested. Screen barrels shall be provided in standard _____ (overall or full) lengths which _____ (include or exclude) the weld ring lengths. Lengths and end fitting configuration to be requested by the contractor and approved by the engineer.

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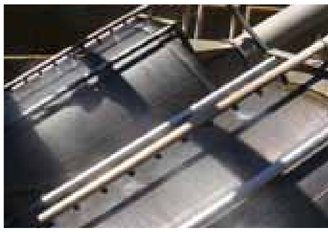

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APPENDIX E

Production Well Logs and Pumping Test Data for Willimantic River Wellfield

Thomas, C. E. Jr., Bednar, G. A., Thomas, M. P., and Wilson, W. E., 1967, *Hydrogeologic Data for the Shetucket River Basin, Connecticut*, USGS, Connecticut Water Resources Bulletin No. 12.

Table 1.--Records of wells--Continued

Current UConn Well #

Well no.	Location	Owner	Date com-pleted	Alti-tude (feet)	Type of well	Depth of well (feet)	Dia-meter (inches)	Depth of casing (feet)	Depth to bed-rock (feet)	Water-yielding material	Static water level (feet below land surface)	Static water level: Date of measure-ment	Yield (gpm)	Draw-down (feet)	Use	Remarks
						e				Town of Mansfield						
Ms 3a	414929N721643.1	J. Topich	4- 3-56	585	Drc	145	6	69	64	Bedrock	27	4- 3-56	6	73	Dom	
Ms 5	414505N721553.1	P. J. Moeckel	12-31-55	270	Drc	80	6	55	50	Bedrock	20	12-31-55	10	60	Dom	
Ms 6	414411N721448.1	H. Sullivan	2-21-57	425	Drc	99	6	74	40	Bedrock	10	2-21-57	30	30	Dom	C.
Ms 8	414347N721243.1	N. Bandas	11-24-58	268	Dr	117	6	117		Gravel	23	11-24-58	7	77	Dom	Finished in gravel.
Ms 9	414544N721120.1	F. Keith	1-25-58	260	Drc	156	6	137	137	Bedrock	40	1-25-58	15	0	Dom	
Ms 17	414533N721111.1	Zearzow		265	Dug	40.5	24			Sand	28.4	5-14-58			Aban	
Ms 19	414547N721143.1	C. T. DeBoer	-57	260	Dug	21.4	36			Sand and gravel	9.8	5-27-58			Obs,Aban	Obs.well, 1958-64
Ms 20	414805N721827.1	C. Snow		330	Dug	10.0	32			Gravel	5.7	11-30-62			Obs,Aban	Obs.well, 1962-64.
Ms 21	414814N721815.1	Mansfield State Training School		407	Dug	13.3	36			Till	9.8	7-10-63			Obs,Aban	Obs.well, 1963-64. Dry, Sept., 1963, and Sept. to Oct., 1964.
~~Ms 22~~	~~414401N721510.1~~	~~A. Bergeron~~	~~10- 3-58~~	~~290~~	~~Dr~~	~~107~~	~~6~~	~~40~~	~~35~~	~~Bedrock~~	~~11~~	~~10- 3-58~~	~~20~~	~~69~~	~~Dom~~	~~C.~~
X Ms 23	414858N721854.1	Mansfield State Training School MTS #1	-13(?)	300	Dug	16.5	240			Sand and gravel	5.4	5-27-64			Aban	Formerly supplied school; replaced by Ms 24 and Ms 25 because of insufficient yield.
X Ms 24	414853N721856.1	do MTS# 2	-48	300	Dr	60	12	35		Sand and gravel	.5	3- -48	525	19	Inst	C. Screen, 25-slot, 35-60 ft. Used alternately with Ms 25.
3 Ms 25	414855N721856.1	do MTS# 3	-58	303	Dr	68	16	48	79	Sand and gravel	4.0	7-24-64	418	9	Inst	C. L. P. Screen, 48-68 ft. Used alternately with Ms 24.
Ms 25a	414857N721855.1	do	-58	304	Dr	28.9	6	30(?)		Sand	7.7	6-24-64			Aban	P. Obs.well during pump test of Ms 25.
Ms 25b	414855N721858.1	do	-58	300	Dr	34.0	2.2	33.5		Sand	3.7	6-26-64			Aban	L. Well point. Obs.well during pump test of Ms 25.
Ms 26	414543N721417.1	D. Goodwin	-58	515	Dr	184	6		35	Bedrock	17	-58	8	123	Dom	C. At 60 ft, yield was 1.5 gpm; at 120 ft, 5 gpm; at 174 ft, 8 gpm.
Ms 27	414727N721220.1	O. Olsen	5-15-56	305	Drc	115	6	46	46	Bedrock	40	5-15-56	4.5	60	Dom	C.
Ms 28	414731N721118.1	D. Squires	10- 1-55	380	Drc	130	6	12	12	Bedrock	16	10- 1-55	3	89	Dom	C.
Ms 29	414621N721140.1	T. Sovald	4-20-63	280	Drc	152	6	109	109	Bedrock	53	4-20-63	20	87	Dom	
Ms 30	414805N721423.1	E. E. Weeks	7- 1-58	608	Drc	173	6	8	3.5	Bedrock	3	7- 1-58	20	127	PS	C. One of 3 wells supplying about 75 people in trailer park.
Ms 31	414503N721538.1	J. McShea		330	Drc	118	6		40	Bedrock	29		3	89	Dom	C.
Ms 32	414447N721143.1	N. Chobot	9-12-62	240	Dr	93	6	14	11	Bedrock	50	9-12-62	15	25	Dom	C.
Ms 33	414919N721355.1	Univ. of Conn.	-27	295	Dug	20	12	10		Sand and gravel			235		Inst	C. Screen, 10-20 ft.
Ms 34	414924N721405.1	do B	-50	311.8	Dr	73.2	12	53	73+	Gravel	8.0	7-21-50	675	24.5	Inst	C. L. Gravel packed; screen, 250-slot, 53-73 ft.
Ms 35	414925N721408.1	do C	-50	312.5	Dr	65	12	45	65	Gravel	7.3	7-21-50	520	19.0	Inst	C. L. Gravel packed; screen, 250-slot.
Ms 36	414855N721338.1	do D	-57	290	Dr	60	12	45	60	Sand and gravel	7	1-10-49	400	14	Inst	C. L. Gravel packed; screen, 45-60 ft.
Ms 37	414807N721633.1	A. L. Pepe	10-15-56	485	Drc	177	6		31	Bedrock	19	-56	4.8	81	Dom	
										Town of Norwich						
Nwh 12	413521N720258.1	Conn. State Highway Dept.	10- -57	65	Dr	272	8		50	Bedrock			20		Com	Highway garage. Yield of 8 gpm at 240-250 ft.
Nwh 30	413335N720245.1	Seeley Thermos, Thermos Div		30	Dr	30	8	10	30	Sand	12.3	12-27-63	240	7	Aban	Formerly used for cooling. Twice was pumped dry. Gravel pack, screen.
Nwh 31	413457N720333.1	E. Kulos	12- 5-63	250	Drc	104	6	74	68	Bedrock	22	12- 5-63	12	63	Dom	C. Main water-bearing fracture at 100 ft.
Nwh 37	413534N720307.1	Occum Water Co.	-62	75	Dug	17	36	17		Sand and gravel					PS	C. Pumped 10 to 100 gpm, depending on season.
Nwh 38	413535N720306.1	do	-64	75	Drc	173	6	20	20	Bedrock			25		PS	C. Pumped 25 gpm, 14 hrs/day.
										Town of Pomfret						
Po 58	415050N720237.1	L. King		721	Dug	20.7	20			Till	12.1	4-26-62			Aban	
Po 65	415420N710220.1	E. Sirrine		817	Dug	25.4	24			Till(?)	19.0	7- 2-62			Dom	Adequate, 1958-61.
Po 66	415357N720209.1	Mrs. E. K. Medbury	-58	815	Dug	16.9	30			Till	5.4	6-30-62			Dom	C.
Po 67	415358N720205.1	do	-57	851	Drc	220	6	$55^{\pm}$					0		Des	No water obtained.

Table 25.--Yields of drilled and screened wells tapping coarse grained stratified drift in the Shetucket River basin.

Wells with large-capacity pumps			Wells with small-capacity pumps	
Well no. (Pl.A)	Yield (gpm)	Specific capacity (gpm/ft)	Well no. (Pl.A)	Yield (gpm)
Ms 24	525	28.4	Clb 13	20
Ms 25	418	46.7	Hb 8[a/]	60
Ms 34	675	27.6	Hb 9[a/]	60
Ms 35	520	27.4	Wil 28	13.5
Ms 36	500	25	Wil 31[a/]	14
Nwh 30	240	34.3		
Wil 4	200	-		
Wil 4a	200	-		

a/ Well is located in an area mapped as fine-grained stratified drift, but is screened in underlying coarse-grained deposits.

THE PUMPING TEST--A KEY TO LOCAL CONDITIONS

A controlled pumping test is one of the most useful tools available to the hydrologist for studying aquifers and determining the effects of large-scale withdrawals. Prior knowledge of aquifer permeability, saturated thickness, and yields of existing wells in an area provide a basis for making preliminary estimates of potential well yields, the effects of pumping on water levels, and the proper spacing of wells. But such estimates do not take into account the effects of local geologic and hydrologic conditions which influence yields and drawdowns. For example, in the Shetucket River basin most coarse-grained stratified drift occurs in relatively narrow river valleys, where the stream and valley walls act as boundaries to the aquifer. The manner in which these boundaries affect yields and drawdowns is generally the same from place to place but, because the geometry and effectiveness of the boundaries vary considerably, the magnitude of their influence is different at each site. Similarly, stratification affects the behavior of an aquifer in a predictable fashion, but the precise effect of the particular conditions of bedding and textural changes at a particular site is unique to that site. A pumping test at the site can provide this information.

As a well is pumped, the water table around the well assumes the shape of an inverted cone, or "cone of depression," with its apex at the pumped well. By analyzing the size, shape, and rate of growth of this cone, not only can the water-transmitting and water-storing characteristics of the aquifer at the test site be determined, but also the effects of local geologic conditions on yields and water levels can be evaluated. Such a test was conducted in the Willimantic River valley at wells of the Mansfield State Training School. The geohydrologic conditions and arrangement of wells at the site are shown in figure 40. Complete data for the test are included in the companion basic data report by C. E. Thomas, Jr., and others (1967). Although the data are applicable only to the test site, the results are similar to those which might be expected from coarse-grained stratified-drift deposits in many of the relatively narrow valleys of the Shetucket River basin.

In this test, one of the supply wells, Ms 25, was pumped continuously for 24 hours on July 23-24, 1964 at an average rate of 418 gpm, and periodic water-level measurements were made in the two observation wells Ms 25a and Ms 25b. Water pumped from Ms 25 was discharged into the storage tank at the school so that no recharge to the aquifer occurred from this source during the test.

With a constant pumping rate, the amount of water-level decline, or drawdown, in each observation well increased with time during the test. At any given time (t) the drawdown was greater in Ms 25b, nearer the pumping well, than in Ms 25a, farther away. To facilitate comparison and analysis of the two wells, the effects of different distances from the pumping well (r) were compensated for by plotting drawdown (s) versus t/r^2 on the single graph shown as figure 41. The measured values of drawdown were corrected, where significant, for the effects of partial penetration, dewatering of the aquifer, and rising trend of the water table prior to the start of pumping.

The aquifer characteristics were determined by fitting the Theis "type curve" (in Ferris and others, 1962) to the early part of the drawdown

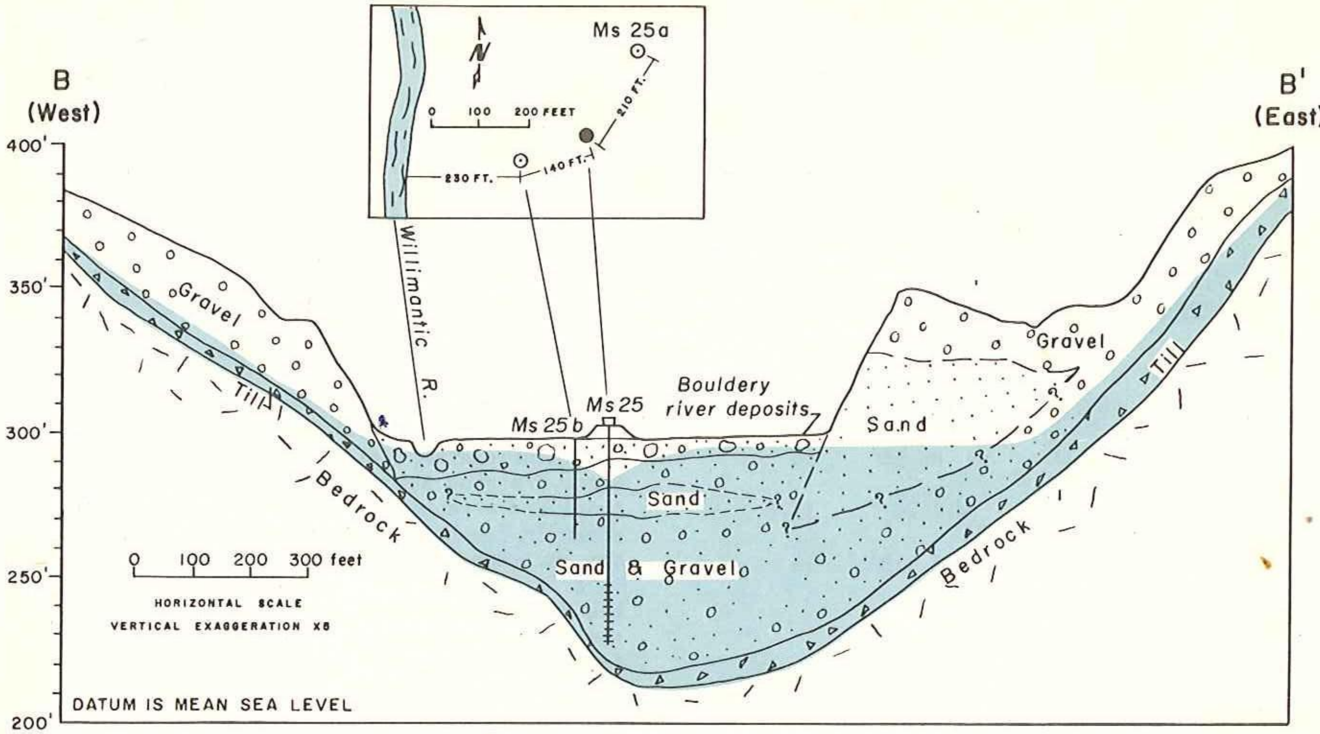

Figure 40.--Geologic cross section of the Willimantic River valley near the wells of the Mansfield State Training School, along line B-B' on plate B.

In a pumping test, Ms 25 was pumped at 418 gpm for 24 hours, causing a cone of depression to form in the water table. Average permeability of the stratified deposits was determined to be 4,170 gpd per sq ft.

data of Ms 25b, as plotted on figure 41. The curve of best fit represents a coefficient of transmissibility of about 242,000 gpd per ft. The saturated thickness of the section ranges from 44 feet at Ms 25b to 72 feet at Ms 25. Dividing transmissibility by an average saturated thickness of 58 feet gives a permeability of 4,170 gpd per sq ft, which is probably representative of the average permeability of the section. Dividing by the maximum and minimum saturated thicknesses gives permeabilities of 3,360 and 5,500 gpd per sq ft, respectively. These values are indicative of the high permeability of the sand and gravel deposits in the valley at this site.

The curve of best fit also indicates a coefficient of storage of 0.00082. This dimensionless parameter is an index of the amount of water released from storage when the aquifer is pumped (see glossary). The low value of 0.00082 indicates that artesian (confined) conditions existed at least during the early part of the test. Such conditions might be expected initially because of the stratification of the deposits. However, as the pumping proceeded, a gradual change to water-table (unconfined) conditions was expected, with a slower rate of drawdown and correspondingly higher storage coefficient eventually approaching a specific yield value of about 30 percent (see discussion of yield, p. 69). Under water-table conditions, the coefficient of storage is approximately equal to specific yield. After 30 minutes of pumping, however, the rate of drawdown in Ms 25b increased noticeably rather than decreased, as indicated in figure 41 by the downward divergence of the plotted points from the "type curve." This divergence suggests that the cone of depression had reached a barrier boundary between the aquifer and a comparatively impermeable zone which could not supply, under the same hydraulic gradient, the quantity of water needed to meet the pumping demands. A second barrier boundary is indicated by a second downward divergence of the plotted points from the refitted type curve.

The positions of the two boundaries cannot be determined precisely from an analysis of drawdowns in the single observation well, Ms 25b, and the boundaries were not reflected in the drawdowns of Ms 25a. However, from an examination of the geologic setting, shown in figure 40, it can logically be assumed that the relatively impermeable till-bedrock valley walls acted as the barrier boundaries. With this assumption, and by applying methods described by Walton (1962, p. 16), the boundaries were determined to be about 600 and 1,800 feet from Ms 25b. These distances correspond approximately to the distances to the west and east valley walls, respectively. The correspondence is only approximate because the boundaries are neither vertical nor completely impermeable, as is assumed in the methods of analysis.

The effects of the barrier boundaries predominated during the latter part of the test and

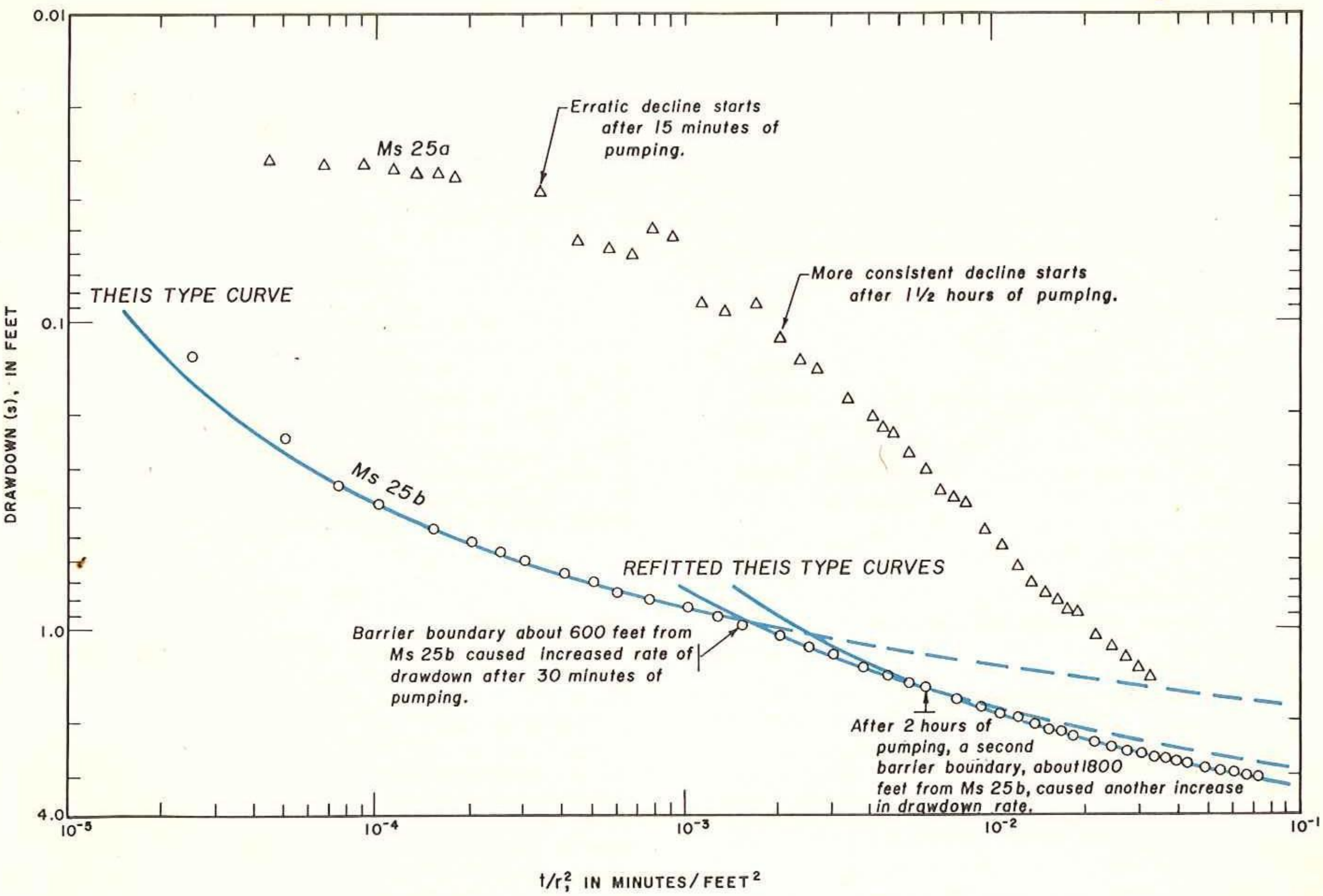

Figure 41.--Drawdowns in observation wells during pumping test at Mansfield State Training School.

The Theis type curve fits closely the plot of points for Ms 25b and permits determination of aquifer coefficients. Breaks in the curve indicate the cone of depression reached the relatively impermeable valley walls.

masked any evidence on the drawdown curve of the transition from artesian conditions to water-table conditions which would normally be expected under the prevailing hydrologic and geologic conditions. Also masked was the effect of the Willimantic River itself acting as a recharge boundary, a source of induced infiltration which would have the effect opposite that of a barrier boundary. If, as is likely, the hydraulic connection is poor between the river and the deep sand and gravel unit tapped by the pumping well, the effects of the recharge boundary would have been negligible as long as artesian conditions prevailed. However, if pumping continued long enough under water-table conditions, the cone of depression would have eventually intersected the river and induced infiltration would have occurred.

Theoretically, a single "type curve" should have fitted the plotted points (s versus t/r^2) for both observation wells. However, as can be seen from figure 41, the drawdown in Ms 25a lagged considerably behind that of Ms 25b. In fact, no significant drawdown occurred during the first 15 minutes of the test, and then the water level declined erratically for the next hour before steadily declining.

The differing responses of the two wells reflect the effects that well construction factors and stratification and heterogeneity of the deposits have on water-level declines. Ms 25b has a well point open to the same unit of sand and gravel as the pumping well, whereas the casing of Ms 25a is open to the sand layer overlying the sand and gravel unit. Because of the artesian conditions which existed in the sand and gravel unit, the water level in Ms 25b responded almost immediately to pumping, whereas the water level in Ms 25a, under water-table conditions, showed no response until the water-table cone of depression reached it. The bottom of Ms 25a is soft and appeared to be plugged with fine-grained sediment, which would in part account for its sluggish and erratic response. Although the artesian type curve could be fitted to at least two groups of data points of Ms 25a, no confidence could be placed in the results and the plot was not used to determine aquifer coefficients.

In summary, the general conditions at the well field of the Mansfield State Training School are probably characteristic of those in the other major but relatively narrow river valleys in the Shetucket River basin. At this site, a large

APPENDIX G

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PUBLIC WORKS DEPARTMENT
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ADDITIONAL WATER SUPPLY FACILITIES
FOR THE
UNIVERSITY OF CONNECTICUT
STORRS, CONNECTICUT
PROJECT NO. BI-D-311C

Dec. 1970

CONSTRUCTION AND TESTING OF
UCONN DEEP WELL NO. 1
MANSFIELD WELL FIELD

DECEMBER 1970

FREDERIC R. HARRIS, INC.
CONSULTING ENGINEERS

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UNIVERSITY OF CONNECTICUT
STORRS, CONNECTICUT
ADDITIONAL WATER SUPPLY FACILITIES
CONSTRUCTION AND TESTING OF
UCONN DEEP WELL NO. 1
MANSFIELD WELL FIELD

1. INTRODUCTION

In accordance with the results of prior subsurface investigations and pumping tests performed in the attempt to delineate a suitable aquifer to supply the future needs for the University of Connecticut, the Mansfield Training School Well Field was selected as the prime aquifer location.

The capacity of this aquifer was estimated at 2500 gpm with five (5) wells each of 500 gpm capacity developing the production. Because of the limited extent of the aquifer an additional full scale pumping test was proposed to establish the optimum well field configuration and verify the aquifer capacity.

Deep Well No. 1 was selected as the test well and contract documents were prepared for the construction and testing of this well. This well will be incorporated as a permanent well in the well field.

The Able Drillers and Pump Company were awarded the contract for the work as a result of competitive bidding.

Frederic R. Harris, Inc. was authorized to provide full time field supervision during both the construction and testing of the well.

2. WELL CONSTRUCTION

Two pilot borings were drilled to establish the depth of the aquifer and to facilitate locating the well. Deep Well No. 1 was located in the vicinity of boring DH-1 which indicated the depth

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to bedrock to be 71.5 feet below ground surface. At DH-2, 100 feet distance, the bedrock was encountered at a depth of 54.8 Ft. below ground surface. Logs of the borings are presented in the appendix.

The well was installed by alternately driving a 30 inch steel casing and cleaning out within the casing by jetting and washing.

Based upon analysis of the aquifer samples the screen size was established as No. 65 slot, 14 inch diameter and 20 feet in length.

After reaching the bottom of the aquifer the screen and riser pipe were bedded on a gravel base. The outer casing was then withdrawn as the gravel pack was placed until the casing was just above the top of the screen and the remaining annular space between the riser pipe and outer casing was filled with the gravel pack material.

The well was developed by surging and bailing. This development required about one week to achieve a stabilized well.

An 800 gpm capacity pump was then installed in the well and a 60 HP electric motor provided at the top of the well to drive the pumps. A discharge line was laid 200 feet to a point on the bank of the Willimantic River downstream of the test site. An orifice meter was provided at the discharge end of the pipe to measure the flow. At the completion of the pump test, the pump and motor were removed and the well casing was extended to elevation 314 and encased in concrete.

3. TEST MONITORING

Concurrent with the construction of the test well, twelve piezometers were constructed to monitor the drawdown. The piezometers were located three each along mutually perpendicular lines at approximate distances of 25, 50 and 100 feet from the test well, as indicated in the location map.

Each piezometer consisted of a 1-1/2 inch diameter well point with a 1-1/2 inch diameter riser pipe. The piezometers were installed in a 6 inch diameter hole and the annular space backfilled with sand to a point five feet above the point. The remainder of the annular space was backfilled with soil.

The depths of the piezometer ranged from 52 to 60 feet, as indicated in the following table:

	Ground Elevation	Depth of Well	Elevation of Well Point*
Piezometer #1	304.7	52.0	252.7
#2	303.0	55.0	248.7
#3	303.7	60.0	244.2
#4	304.5	55.0	250.3
#5	303.3	56.0	247.6
#6	303.2	60.0	244.0
#7	304.1	51.0	253.8
#8	304.4	60.0	245.5
#9	304.3	58.9	245.9
#10	303.3	57.0	247.1
#11	304.1	60.0	244.4
#12	304.4	60.0	244.7

*Datum 306.5 Ft. on finished floor of abandoned Pump House.

Three methods of obtaining water level readings were used:

1. Stevens Automatic Water Level Recorders.
2. Terra Tech points and automatic recorders.
3. Manual use of sensor.

Three Stevens Automatic Water Level Recorders were kindly loaned by the Geological Survey Water Resources Division of Connecticut. The recorders were used on Piezometers P4, P8 and P10. During the progress of the test, various time scales were employed in order to achieve the maximum degree of accuracy. These recorders functioned perfectly providing the most comprehensive set of data.

The Terra Tech system consisted of points provided with a sensitive diaphragm which permits bleeding of a pressure source to maintain equilibrium. The pressure is automatically plotted on a recorder. A great deal of difficulty was encountered with this system, primarily in the excessive use of CO_2, the delicacy of the apparatus, a significant time lag in response to changes in water level and the lower degree of accuracy. The records obtained with this equipment were considered unusable.

Manual observations using a sensor were employed in the nine piezometers which originally had been equipped with the Terra Tech System.

4. PUMP TEST PROCEDURE

The two existing wells in the well field currently supply the needs of the Mansfield Training School and these requirements had to be satisfied during the course of the test.

The interference to the test by the starting and stopping of the Mansfield Wells would have resulted in a set of data with an extra degree of complexity for analysis. It was decided that the effects of the Mansfield Well would be best nullified if that well was kept pumping continuously throughout the test.

Twice during the course of performing the pump test interruptions in the pumping resulted in the aborting of the test in progress.

Finally on September 7th, pumping was started at Mansfield Training School Well No. 3 and continued for nearly 3 days at a rate of 500 gpm to stabilize water levels in the well field and to achieve near equilibrium conditions prior to the commencement of pumping of Deep Well No. 1. When this condition was established it was then possible to disregard the interference from Mansfield Well No. 3 on the observed water levels in the various piezometers and at the test well during the test of Deep Well No. 1.

Pumping of the test well was started at 14:25 EST September 10 and was continued until 11:00 A.M. September 18, 1970. An average pumping rate of 750 gpm was maintained and drawndown measurements were obtained in all twelve piezometers.

The drawdown data for piezometers P1, P4 and P10 are tabulated in the appendix.

The original graph records obtained from the Stevens Automatic Water Level Recorders for Observation Wells P4, P8, and P10 are included in the original copy of this report.

Data for all other piezometers were recorded in notebook form and will be kept in the Frederic R. Harris files for future references.

5. ANALYSIS OF PUMP TEST

Drawdowns in the observation wells were plotted against time on logarithmic paper to permit analysis by matching with the Reverse-Type Curve. The data plots for Piezometer No. 1, No. 4 and No. 10 were matched with the Reverse-Type Curve and values of transmissibility (T) and storage coefficients (S) were calculated. Based on early time-drawdown data, the following results were obtained:

Piezometer No.	T (gpd/ft)	S
1	93,848	0.003
4	120,330	0.011
10	127,056	0.017

After about 300 minutes of pumping, the time rate of drawdown in the observation wells increased and the data plot deviated upward from type-curve traces, indicating the presence of a barrier boundary. The distance from the image well to the observation well was calculated with the following equation:

$$r_i = r_r \sqrt{t_i/t_r}$$, where

r_i = distance from image well to observation well in ft.

r_r = distance from pumped well to observation well

t_r = time after pumping started before the boundary becomes effective for a particular drawdown to be observed, in minutes.

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t_i = time after pumping started, after the boundary becomes effective when the divergency of the time-drawdown curve from the type curve, under the influence of the image well, is equal to the particular value of drawdown at t_r, in minutes.

The distance from piezometer P1 to the image well was found to be 663 feet. Similarly the distance from piezometer P4 to the image well was found to be 616 feet and the distance from piezometer P10 to the image well was found to be 685 feet. These calculations indicate the image well to be located about 700 feet from the test well and a barrier boundary to be located mid-way between the two at a distance of 350 feet from Deep Well No. 1.

Departures between the observed data and the trace of the type curves were plotted and again matched with the type curve. The plotted points of the first departure deviated below the trace of the type curve indicating the presence of a recharge boundary.

The distance from observation well P10 to the image well was found to be 248 ft. and the distance from P1 to the image well was found to be 302 feet. The recharge boundary was thereby located at a distance of 165 feet from Deep Well No. 1.

The actual position of the nearby bank of the Millimantic River is 110 ft. from Deep Well No. 1 or 20 feet from observation well P10. The hydraulic position of the river appears to fall near the center of the stream.

Distance drawdown graphs were prepared by plotting on semi-logarithmic paper the drawdown in each observation well versus the distance of the observation well from the pumping well. The drawdown measurements used were those made at essentially the same time at the end of a pumping period of 10,000 minutes. Drawdown data are given below:

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Observation Well Number	Distance from Pumped Well (Ft.)	Drawdown (Ft.)
P1	100	13.59
P2	45	14.28
P3	25	15.19
P4	100	12.96
P5	50	13.72
P6	25	14.56
P7	100	11.30
P8	45	13.91
P9	25	14.45
P10	90	11.05
P11	50	14.01
P12	25	14.54

A straight line was drawn through the data for the observation wells parallel to the river and the slope of the line was substituted in the equation $T = \frac{5280}{\Delta s}$ for computation of T. The coefficient of transmissibility was found to be 148,314 gpd/ft. and the coefficient of permeability to be about 2557 gpd/sq. ft.

Evidence of a hydraulic interconnection between the aquifer and the river is shown by a comparison of slopes or hydraulic gradients of lines of wells perpendicular and parallel to the river. The gradient for the wells perpendicular to the river is much steeper than the gradient for the wells parallel to the river, indicating that the cone of depression was distorted by the presence of the river and that water from the river was diverted into the cone of depression by induced infiltration. A similar conclusion is reached by inspection of the shape of the cone of depression at the end of a pumping period of 10,000 minutes as outlined in a cross-section along the line of wells perpendicular to the river.

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6. WELL FIELD ANALYSIS

The well field design analysis was based upon utilizing the minimum number of wells which would satisfy the following criteria:

a. The maximum drawdowns be limited to 67 per cent of the aquifer thickness.

b. A minimum of 5 feet of water be available above the minimum design screen length.

Based upon the pump test results distance-drawdown relationships were developed for pumping rates of 850 gpm, 650 gpm, 500 gpm, 400 gpm and 350 gpm to permit analysis of well fields having 3, 4, 5, 6 and 7 wells respectively.

Using the distance-drawdown relationships and the well field layouts the effects of overlapping zones of influence for each well were then evaluated.

The total drawdown at each well was determined by superposition of the drawdown caused by each well on the well being studied.

The determination for the minimum screen length required was based upon the following criteria:

- a gravel pack is used
- the minimum diameter screen is used.
- one half of the open area of the screen is blocked by the gravel pack.
- a 60 slot opening is used.

The equation used is $L_s = \frac{Q}{7.48 A_o V_c}$

where

L_s = minimum screen length, ft.

Q = discharge, gpm

A_o = effective open area per foot of screen, sq. ft.

V_c = optimum entrance velocity, fpm

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Using the substitution

$A_o = 0.5\ A_s$

where A_s = total open area of screen, sq. ft., the equation

reduces to $L_s = \frac{Q}{3.74 A_s V_c}$

V_c is a function of the slot design and permeability of the aquifer. For an aquifer having a permeability, k = 2600 gpd/sq. ft.,

V_c = 7 fpm., and

$L_s = \frac{Q}{26.18 A_s}$

The results of the various designs are presented in the following tables:

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No. of Wells	Q/Well (gpm)	Q_T gpm	D ft.	$H_A - D$ ft.	$\frac{D}{H_A}$ (%)
3	850	2550	47.2	14.8	76.0
4	650	2600	46.9	15.1	75.6
5	500	2500	46.9	15.1	75.6
6	400	2400	42.4	19.6	68.5
7	350	2450	38.3	23.7	61.5

Note: Available Aquifer, H_A = 62 ft.

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MINIMUM SCREEN LENGTHS
(60 Slot)

No. of Wells	Q/Well gpm	Screen ø Inch	A_s Sq. Inch	L_s Ft.	$L_s + 5$ Ft.	$\frac{L_s + 5}{HA - D}$
3	850	36	306	15.1	20.1	1.36
4	650	36	306	11.5	16.5	1.09
5	500	30	268	10.1	15.1	1.00
6	400	14	160	13.7	18.7	0.96
7	350	12	144	13.3	18.3	0.78

Analysis of the drawdown results indicates excessive drawdowns for the schemes using 3, 4 and 5 wells. The schemes with 6 and 7 wells satisfy the criteria.

The second table compares the minimum screen length requirement with the remaining available aquifer thickness. A factor greater than 1.0 indicates that the available aquifer is insufficient for placement of the required screen. The 3 and 4 well schemes cannot be physically accommodated in the aquifer due to excessive drawdown.

The minimum well field configuration which satisfies the criteria is the 6 well group with a 14 foot long 14-inch diameter slotted screen.

7. CONCLUSIONS AND RECOMMENDATIONS

The installation and full scale long term pump testing of Deep Well No. 1 has provided excellent data for establishing the characteristics of the Mansfield Well Field aquifer.

The aquifer is relatively homogeneous and consists primarily of sands, with varying percentages of gravel and minor amounts of silt.

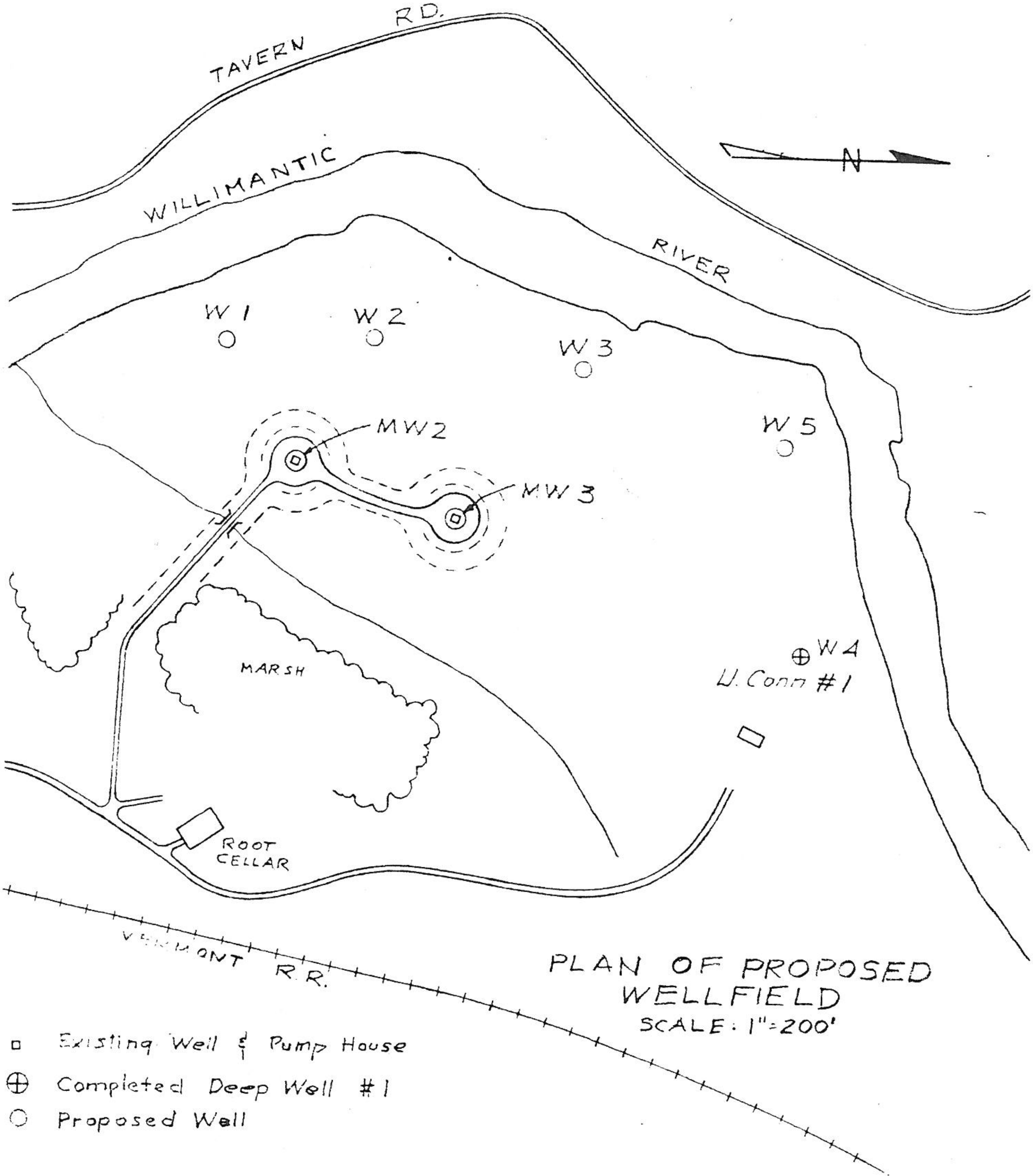
The area extent of this aquifer is limited by the rock boundaries of the valley sides and the aquifer is in hydraulic connection directly with the Willimantic River.

The properties of the aquifer are:

- Capacity 2500 gpm
- Coefficient of Transmissibility, T = 148,000 gpm/ft
  (as compared to T = 90,000 gpd from 1968 report)
- Specific field = 39 gpm/ft. drawdown

The recommended well field which will fully develop the aquifer consists of six deep wells rated at 400 gpm each. The field will include existing Mansfield Well MH-3, Deep Well No. 1 and four new deep wells. The second existing Mansfield Well will remain as standby service to Mansfield Training School.

Each of the new wells will contain a 15 foot long 12-inch diameter screen with No. 60 slots.



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PLAN - WELLFIELD
&
HYDRAULIC PROFILES

G-15

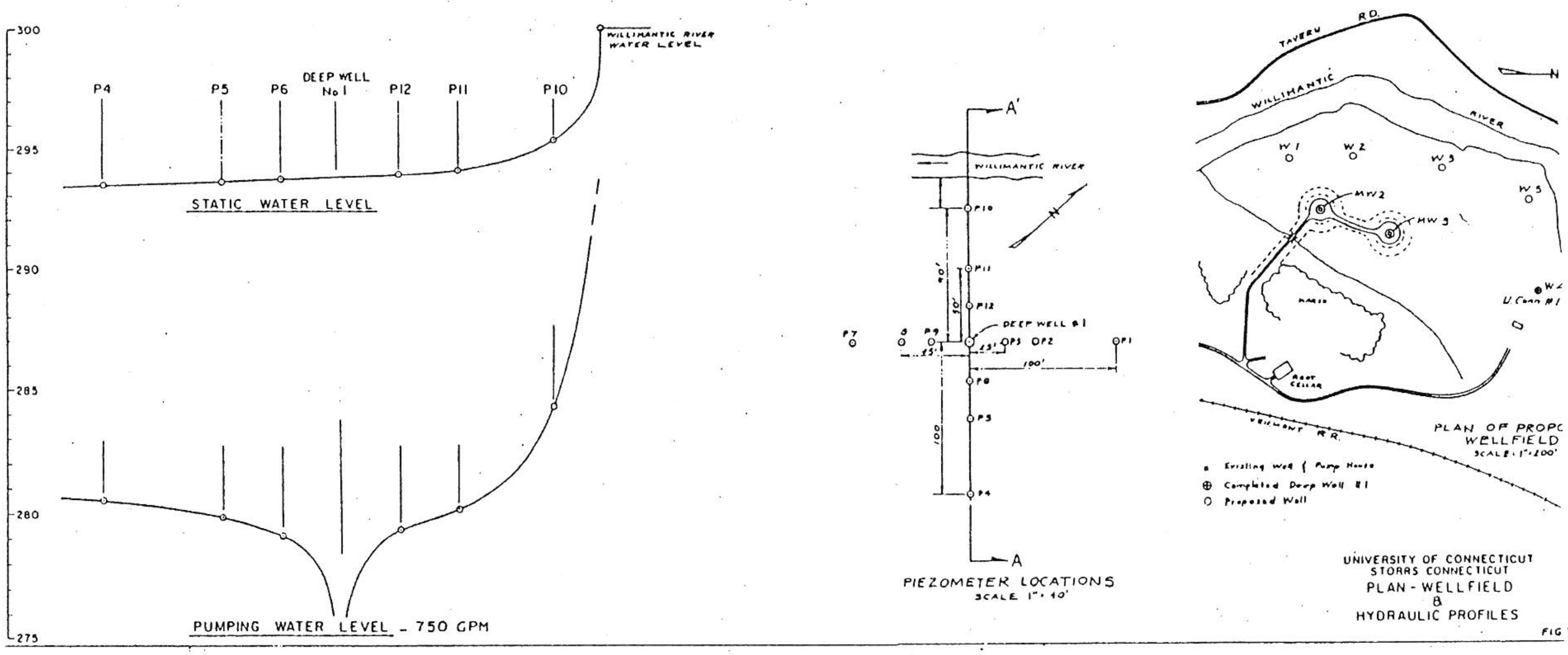

FIG 1

FIGURE 1

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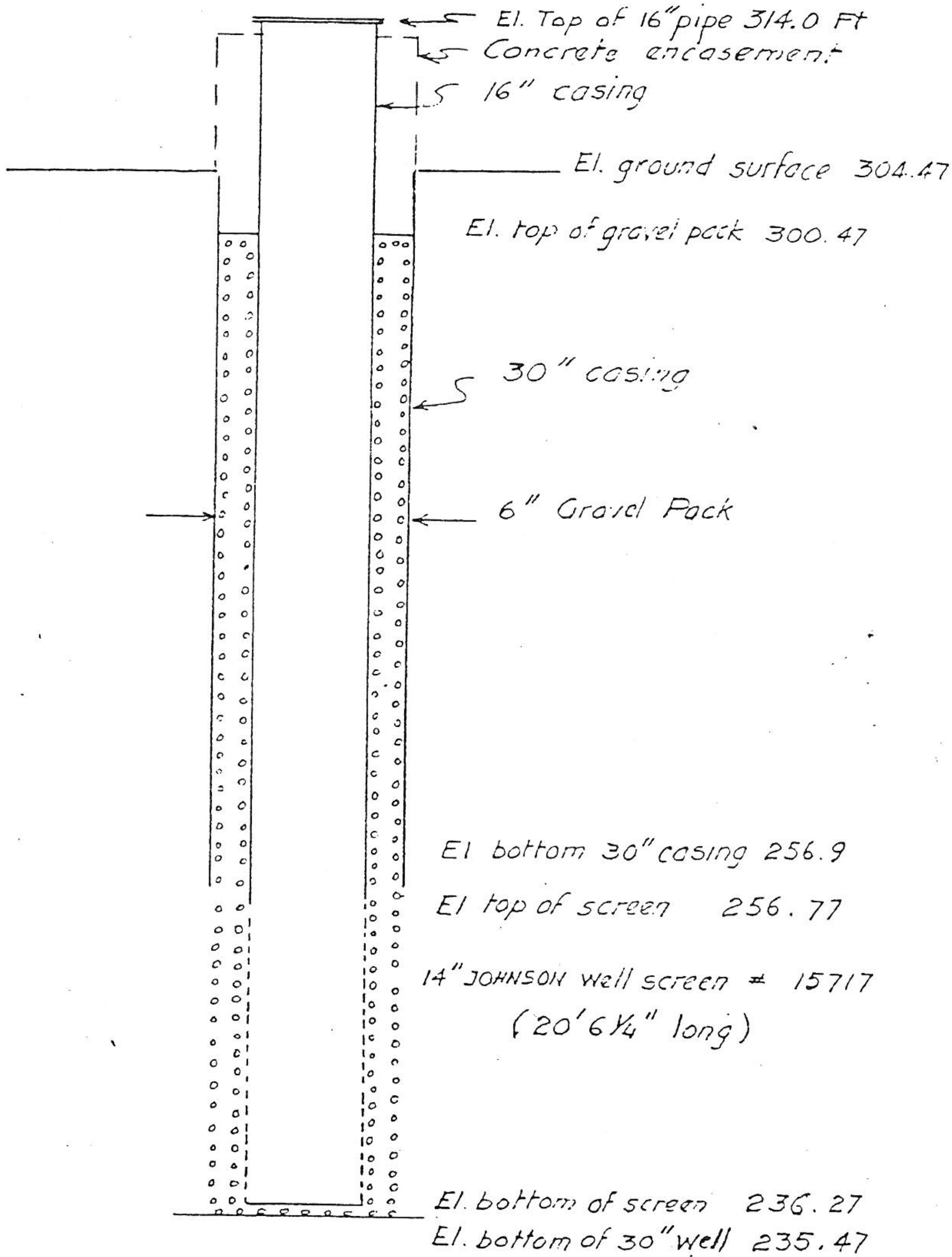

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DEEP WELL No 1

SCHEMATIC

FIGURE 2

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MOTOR Well Pump #1 LOCATION Willimantic River

Name Plate Data

HP 75 FLA 87 VOLTS 460 FR B364TP12

RPM 3550 Hz 60 Ph 3 S.F. 1.15

MODEL # 5K6257XH549A RUN HOURS 12 hrs/day

SERIAL # KKI1009429 MANUFACTURER GE

Measured Data

VOLTS 460 FLA 93 P.F. 54.4% [illegible]

Motor overloaded by 6.9%

Calculated Data

KVA 74 KW 62 KVAR 40

PUMP

Name Plate Data

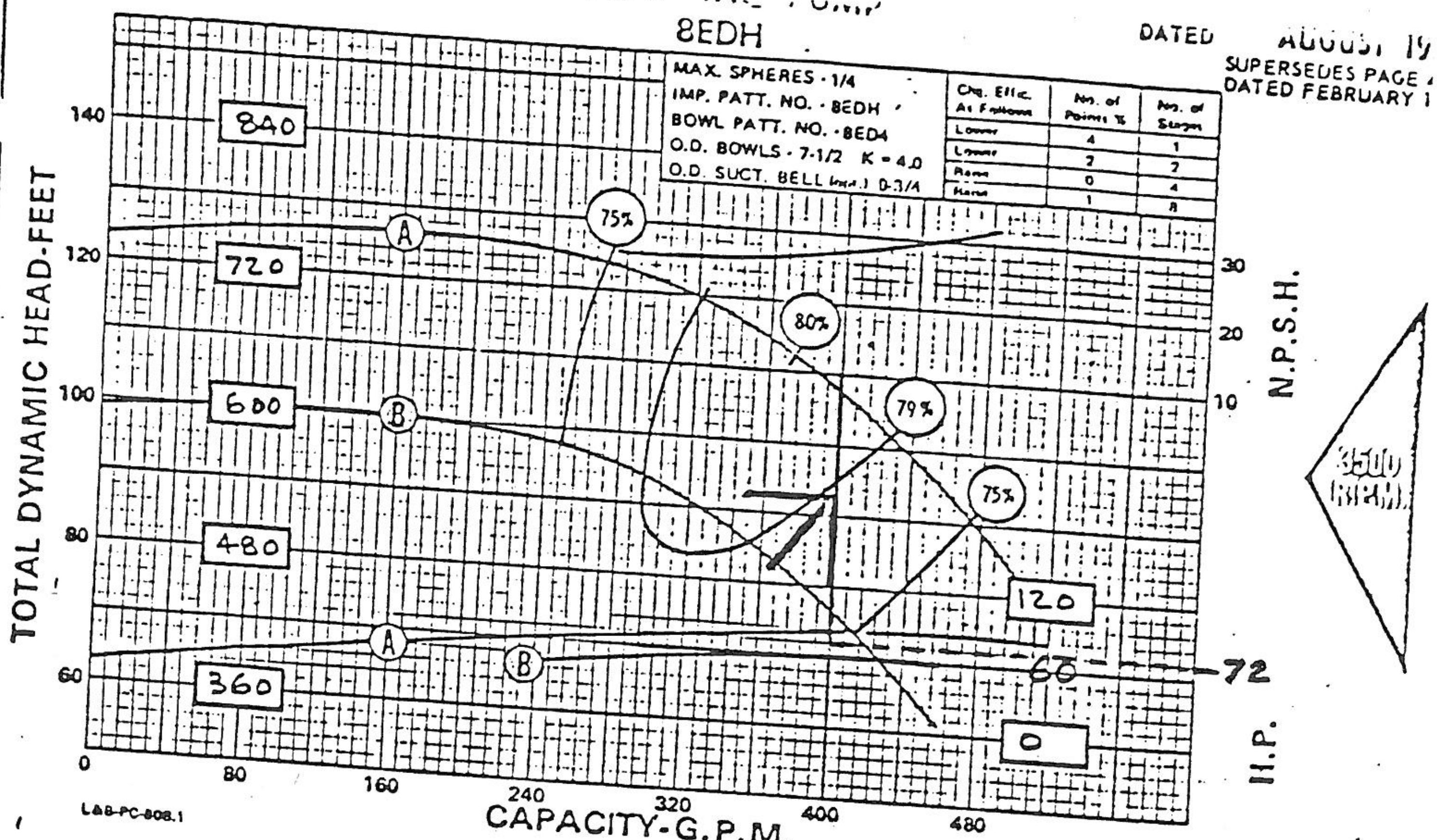
MODEL # 8EDH SERIAL # V74-02836

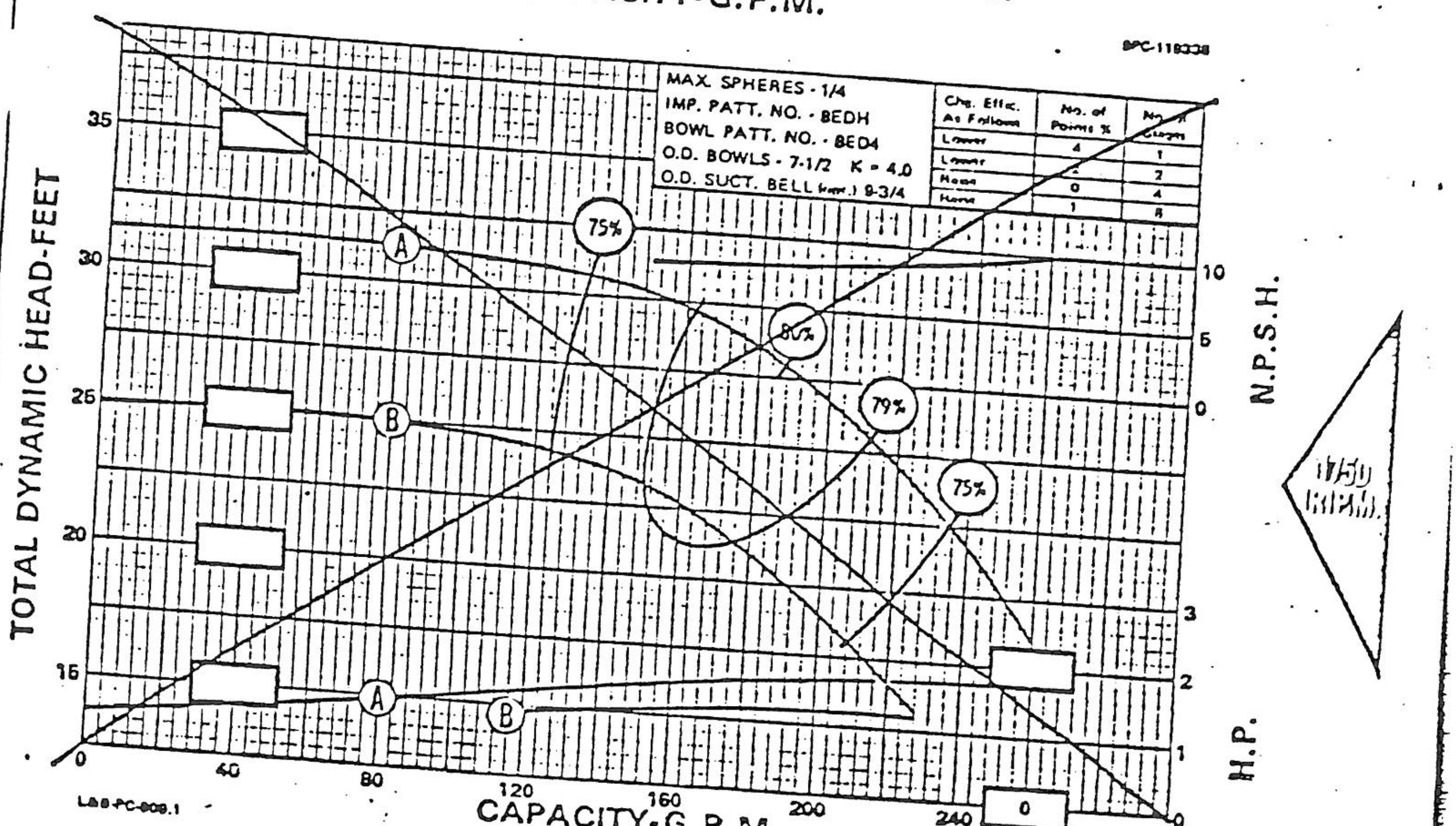
SIZE 6 stage GPM 400 FT. HEAD 555

RPM 3500 MANUFACTURER Aurora Vertiline Pump

Pumps 100 gals. in 15 secs @ 180#

400 gpm





LAYNE AND BOWLER
A SUBSIDIARY OF THE AURORA PUMP
UNIT OF GENERAL SIGNAL

NUMBER OF STAGES REQUIRED FOR APPLICATION. 6

STANDARD CURVE ILLUSTRATES SINGLE STAGE PERFORMANCE ONLY.

UConn Well #2
APPENDIX H

R. E. CHAPMAN COMPANY

DRILLING CONTRACTORS

30 NORTH MAIN STREET
WEST BOYLSTON, MASSACHUSETTS 01583-1126
TELEPHONE (508) 835-6231
MASSACHUSETTS: 800-727-6231
FAX (508) 835-3978

April 1, 1994

Mr. Richard Brand
University of Connecticut
Utilities Department
189 Auditorium Road
Storrs, CT 06269-1038

Re: Redevelopment of Well No. 2

Dear Mr. Brand:

We are sending this letter to provide you with information on the results of our redevelopment of Well No. 2.

Well No. 2 was installed by the R. E. Chapman Company in 1974. This well is a 24-inch by 14-inch gravel packed well that was 67.5 feet deep from the original ground surface. The well was completed with 15 feet of 14-inch diameter stainless steel wire-wrapped screen. After the well was installed, a 48-hour pumping test was conducted to evaluate the well yield. During this test, the well was pumped at a rate of 361 gallons per minute (gpm) and the drawdown in the well was measured to be 40.5 feet. This corresponds to an original specific capacity of 8.9 gallons per minute per foot of drawdown (gpm/ft). We have attached a copy of our original Well Construction Record for your information.

Well Redevelopment

The well redevelopment work was started on September 13, 1993 and was completed on September 22, 1993. The redevelopment work included pumping and surging the well along with chemical treatments using chlorine bleach, muriatic acid, and polyphosphates. Before the redevelopment work was started, the well was rated at 175 gpm with 26.20 feet of drawdown. This corresponds to a specific capacity of 6.7 gpm/ft, or about 75 percent of the original specific capacity. After the redevelopment work was completed, the well was rated at 191 gpm with 22.10 feet of drawdown. This corresponds to a specific capacity of 8.6 gpm/ft, or about 97 percent of the original specific capacity. We have attached a copy of our log of Well Rehabilitation for your information.

Pumping Equipment

After the pumping equipment was removed from the well, the pump bowl assembly and column pipe were sandblasted, disassembled and inspected. The bowl assembly, including the impellers, bushings and shaft were found to be in poor condition and it was decided to purchase a new bowl assembly rather than try to repair the existing bowl assembly. We have attached a copy of the Performance Curves for the new Deming Model M6 pump. When the new pump was installed, we also installed a new 4-inch check valve and replaced the air-line and altimeter gauge. After the pump was installed, we conducted a 1½-hour pumping test and collected a water sample for bacterial analysis. The data from the pumping test and water quality analyses are attached to this letter.

Please contact me at (508)835-6231 if you have any questions about the attached information.

Very truly yours,

R. E. CHAPMAN COMPANY

Andrew Chapman

Andrew D. Chapman, P.E.

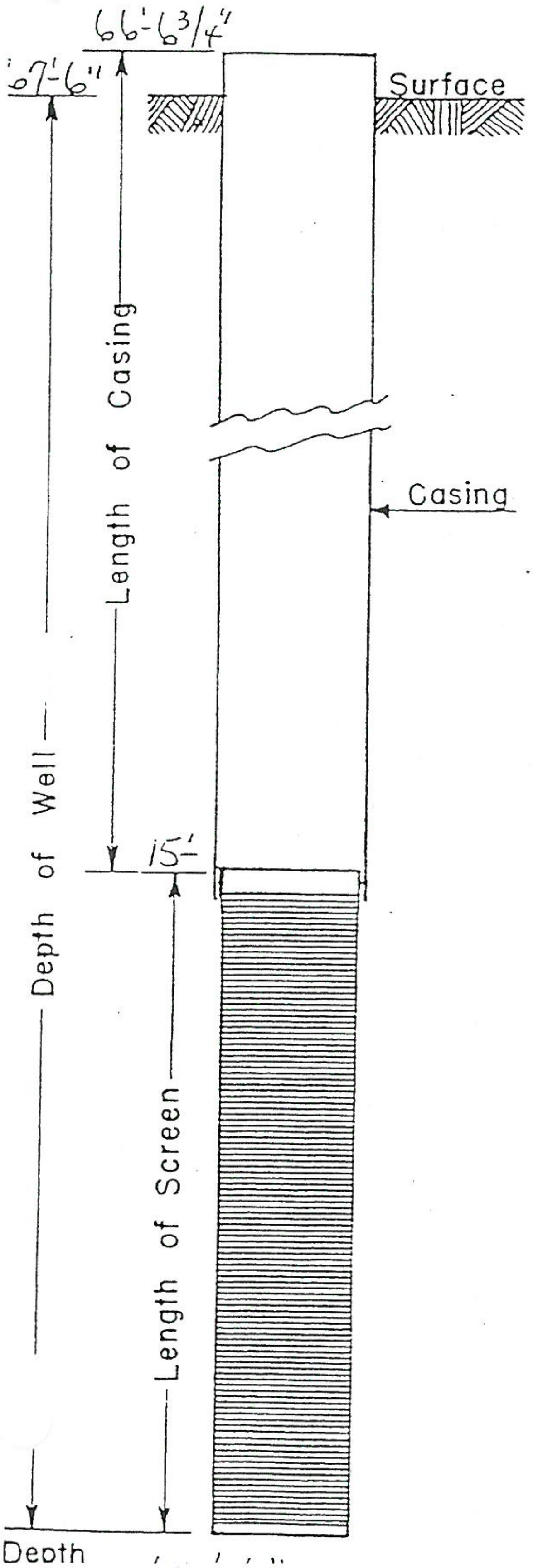
ADC/ar
attachments

H-3

R. E. CHAPMAN CO.

WELL CONSTRUCTION RECORD

FEB 28 1974



WELL OWNER Mansfield Conn.
Off-Rte. 32

WELL NO. II

Date 2-8-74

CASING DETAILS

Length 48'+Shoe 66'-6 3/4" ft.

Diameter 24" 14" in.

Kind 1/2"-Steel Loloy

SCREEN DETAILS

Make Johnson

Length 15' ft.

Diameter 14" in.

Slot size 100

Metal Stainless Steel

SCREEN FITTINGS

Top Weld on

Bottom Welded plate

PUMP TEST

Static level 3' ft.

Rate 361 g.p.m.

Draw down 40.5 ft.

Hours pumped 48 hrs.

ARTIFICIALLY GRAVEL TREATED

Yes ✓ No

Thickness 24" X 14" in.

Size of gravel 10 Mesh + 1/8 mixed

DRILLER Edward M. Lerch

DEMING Pump

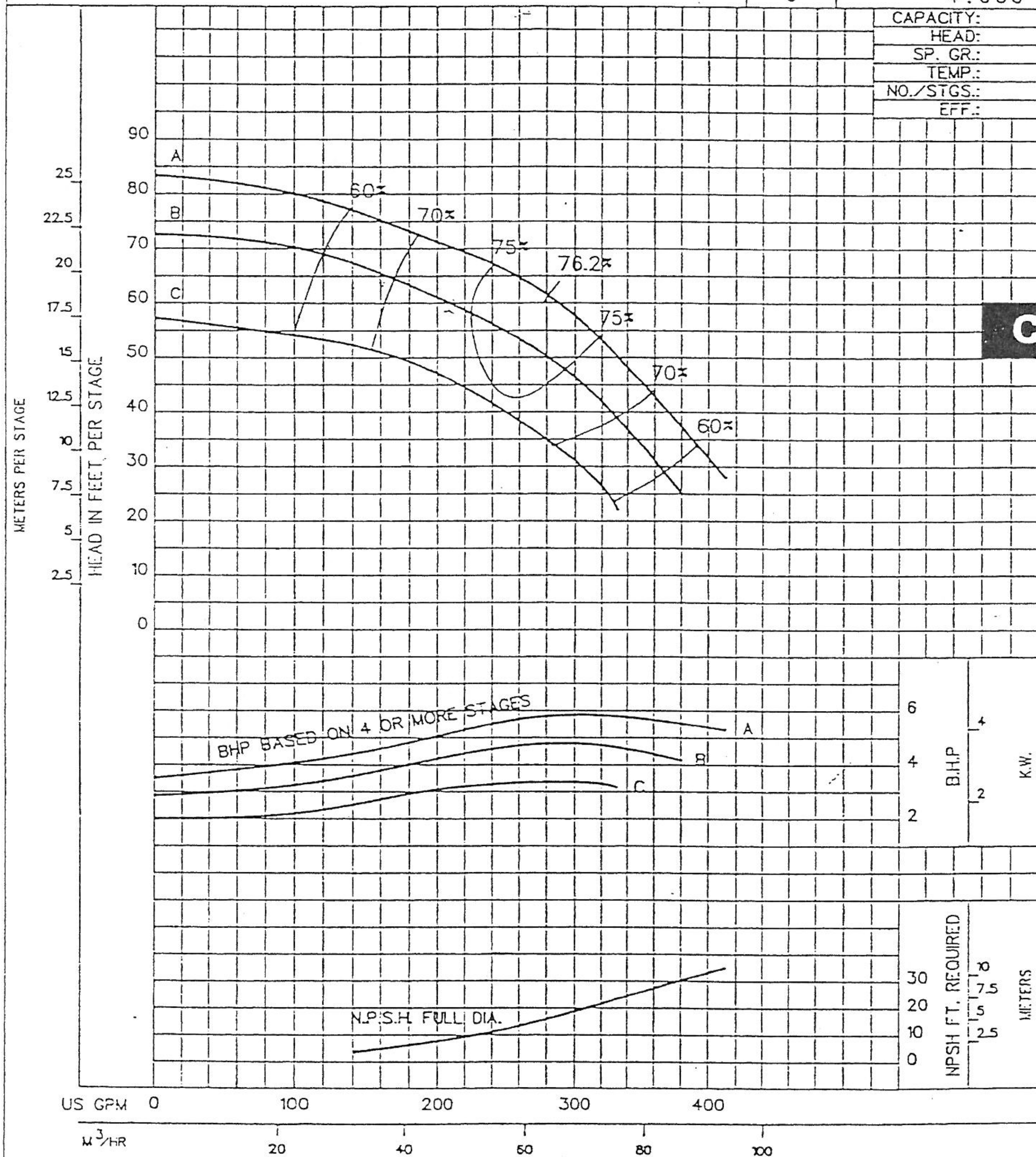
SIZE M6 — SINGLE STAGE PERFORMANCE — 3500 R.P.M.

EFFICIENCY CHANGE:			
4 STAGE DEDUCT	0	POINTS	
3 STAGE DEDUCT	1	POINTS	
2 STAGE DEDUCT	3	POINTS	
1 STAGE DEDUCT	6	POINTS	

SEMI-ENCLOSED IMPELLER

IMP. NO.	22750
BOWL NO.	4463

CURVE	IMPELLER DIAMETER
A	4.812
B	4.500
C	4.000



CUSTOMER:	JOB:
ENGINEER:	CONTRACTOR:
P.O.: S.O.:	SUBMITTED BY/DATE: CERTIFIED BY/DATE:

H-5

UConn Well #2

LOG OF WELL REHABILITATION

R. E. CHAPMAN COMPANY, OAKDALE, MASSACHUSETTS

Date Started: 9-13-93 Date Finished: 9-22-93

Name and Address of Job: University of Connecticut

Customer's representative in charge of this work: Dick Brand

Well number and location: Well No. 2, Mansfield, CT

Well installed originally by: R.E. Chapman Company

Type of work to be done: Redevelop well with chemicals

Name of driller: Mert Libbey Helpers: Mark Chenaki

Depth of well: 80' 6" Length of screen: 15' Size of well: 14"

Original GPM 361 with 40.5 feet of drawdown from top of pipe.

Original static water level: 3' Static before treatment: 27.70'

Depth of well before treatment: 80' 6"

Capacity of well before treatment: 175 Drawdown before treatment: 26.20

Kind of treatment used: Bleach - Muriatic Acid - Phosphates

Amount of treatment used 220 gals - 165 gals - 150 lbs.

Capacity of well after treatment 191 Drawdown after treatment 22.10

Static water level after treatment 27.10

Type and condition of pump Poor

Hours moving to and from job 3 hrs

Hours removing and resetting pump 12 hrs

Hours surging and installing and removing surge pump 55 1/2 hrs

Hours trucking 1 Type of truck Pick-up Mileage driven 61

For what haul pump and column pipe to Scott Associates in Clinton, MA

Total hours to complete job 71.5

Condition of well on completion of work Good

Was pump reconditioned before reinstalling No, pump was replaced

Remarks New Deming - M6 - 9 stage pump was

University of Connecticut

Well No. 2 - Mansfield, Connecticut

Final Performance Test Data

Date: March 15, 1994

Static Water Level: 26 feet

Test Point	1	2	3
Pumping Rate (GPM)	120	160	210
Water Level (ft.)	39	43	49
Pressure (psi)	257	232	205
Voltage	488/488/484	489/489/485	486/487/483
Amperage	47/51/47	50/54/50	52/57/53
Specific Capacity (gpm/ft)	9.2	9.4	9.1
Total Dynamic Head (ft)	630	575	520

LENARD ENGINEERING, INC.

CIVIL, ENVIRONMENTAL AND HYDROGEOLOGICAL CONSULTANTS

1066 Storrs Road
P.O. Box 580
Storrs, CT 06268
Tel: (860) 429-5400
Fax: (860) 429-1367

140 Willow Street
Suite 8
Winsted, CT 06098
Tel: (860) 379-6669
Fax: (860) 738-1272

319-A Southbridge Street
Auburn, MA 01501
Tel: (508) 721-7680
Fax: (508) 832-5366

www.lenard-eng.com

December 16, 1999

Mr. Paul Ritsick
Connecticut Department of Public Health
Water Supply Section
450 Capitol Avenue MS #51WAT
P.O. Box 340308
Hartford, CT 06134-0308

RE: UCONN Well #4 Safe Yield Test Results; *LEI Project No. 97-513.2*

Dear Mr. Ritsick:

The University of Connecticut (UCONN) has successfully completed a well yield test for the replacement Well #4 in the Willimantic River wellfield. The test was performed in two steps, a 72-hour pumping of Well #4 alone and a 5-day wellfield test of Wells 1, 3, and 4..

72-hour Well #4 Yield Test

Lenard Engineering, Inc. (LEI) monitored antecedent trends for eight days between 08/11/99 and 08/18/99. The pumping of the new Well #4 commenced on Thursday, 08/19/99 at 8:15 at a rate of 290 gpm. The initial pumping rate was limited by the settings of the turbine bowls. The pump was adjusted on Friday, 8/20/99 at 10:30 to provide the target pumping rate of 500 gpm. The water pumped from Well #4 was discharged into the Willimantic River 500 feet downstream.

Well #4 pumped at 489.6 gpm for 72 hours without interruption until Monday, 08/23/99. The drawdown stabilized in Well #4 at an elevation of 247.8 feet which resulted in a specific capacity of 21.67 gpm/ft for Well #4. Based on the available drawdown level to an elevation of 244.7 feet, the ultimate yield for Well #4 is 560 gpm.

The yield testing was performed during a period of extended drought and historical low flows for the adjacent Willimantic River. The depressed water table provided a very conservative starting point for the determination of safe yield. We believe that lowering the safe yield to 90% of the ultimate yield is not warranted in this situation. Therefore, the safe yield of Well #4 is 560 gpm.

As shown on the Pump Data Sheet in Attachment N, the Well #4 pump can deliver 540 gpm at 484 TDH. This exceeds the registered diversion rate of 500 gpm for Well #4. Therefore, Well #4 is not restricted to the capacity of its pump.

5-day Wellfield Yield Test

Two additional wells were activated to assess the total wellfield yield on Monday, 08/23/99. Well #1 and Well #3 pumped until 12:00 on 08/28/99 at 286.55 gpm and 281.76 gpm, respectively. During this period, Well #4 was throttled down to pump at 413.97 gpm. The total yield of Wells 1, 3, and 4 during the 5-day pumping test was 982.3 gpm or 1,414,500 gallons/day. The pump test data shows that all three wells reached stabilization at these pumping rates. The water from the Well #1 and Well #3 was pumped into the distribution system. Well #4 was pumped into the Willimantic River.

Documentation

Attachment A – Production Well Charts
Attachment B – Production Well Data
Attachment C – Monitoring Well Charts
Attachment D – Monitoring Well Data
Attachment E – Piezometer Charts
Attachment F – Piezometer Data
Attachment G – Precipitation Data
Attachment H – Stream Gauging Data
Attachment I – Willimantic River Wellfield Site Map
Attachment J – Well Driller's Log
Attachment K – Well #4 Schematic
Attachment L – Well #4 Design Summary
Attachment M – Well #4 Sieve Analysis
Attachment N – Well #4 Pump Specifications

Lenard Engineering, Inc. is pleased to submit the enclosed information for your records. If you have any additional concerns, please feel free to contact us at (860) 429-5400.

Very truly yours,

Jim Ericson

James Ericson, P.E.
Principal Engineer

Chris Till

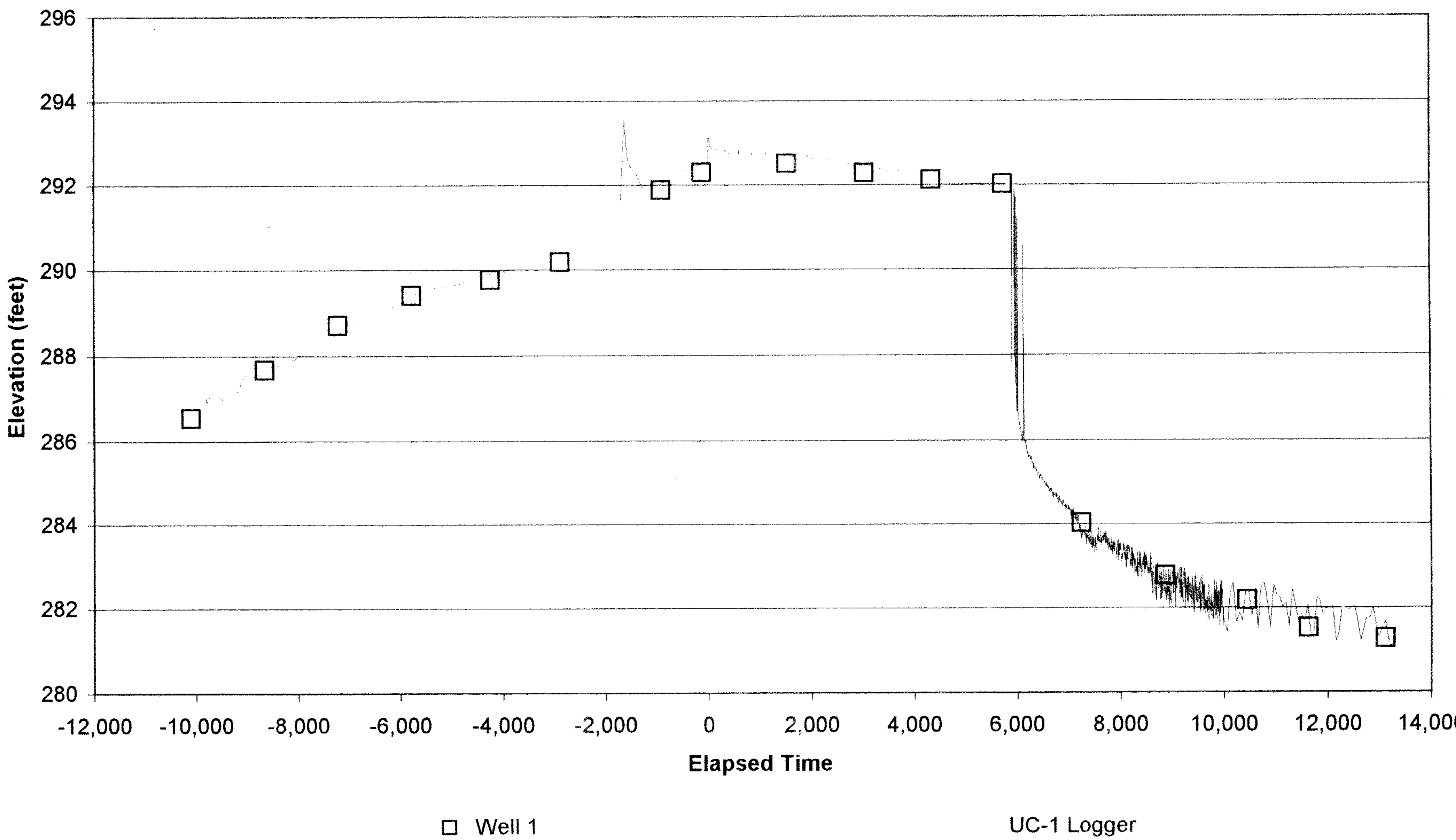
Christopher Till, P.E.
Project Manager

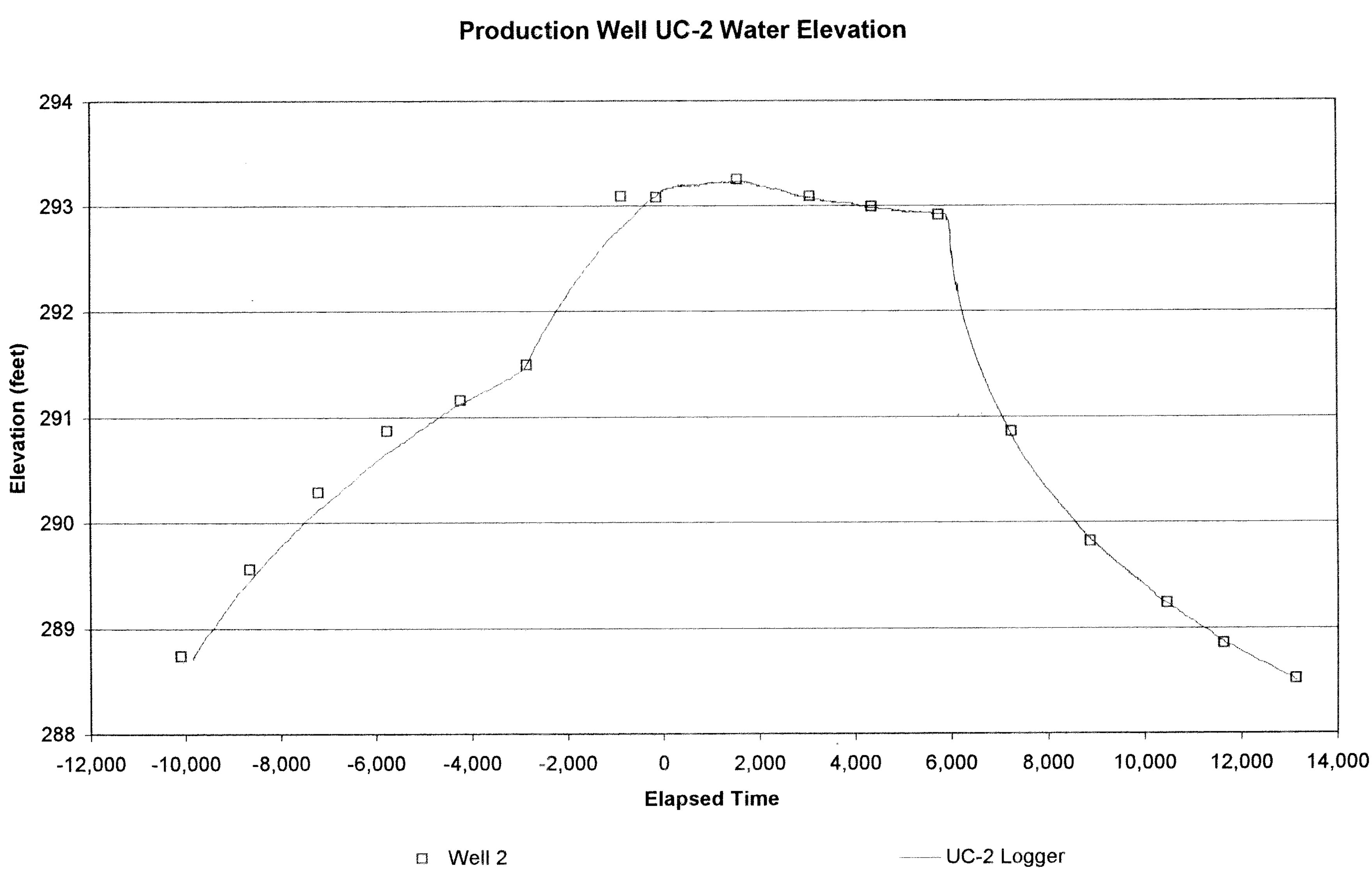
Attachments

cc: Mary Ann Ettinger, UCONN
file

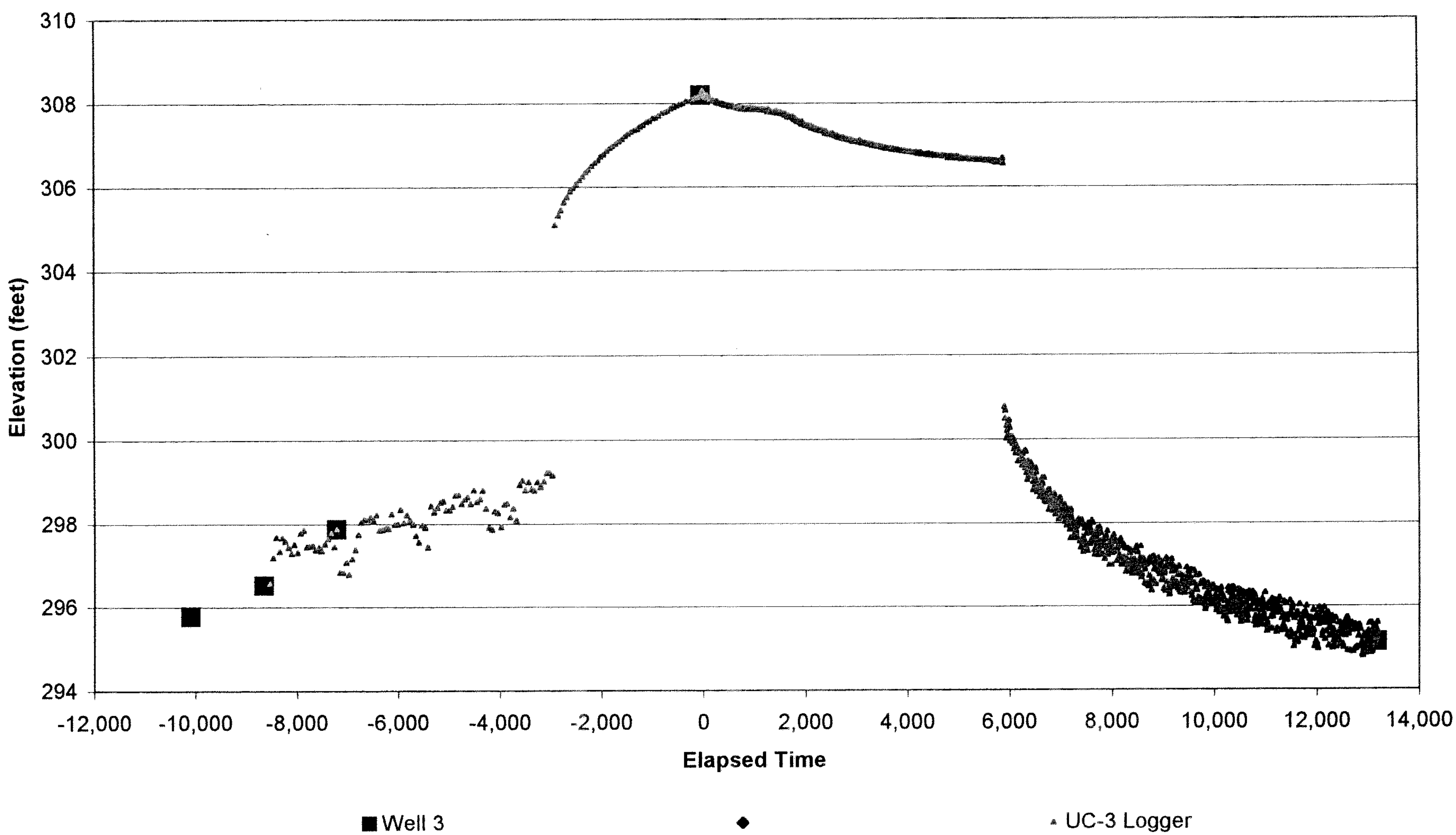
A

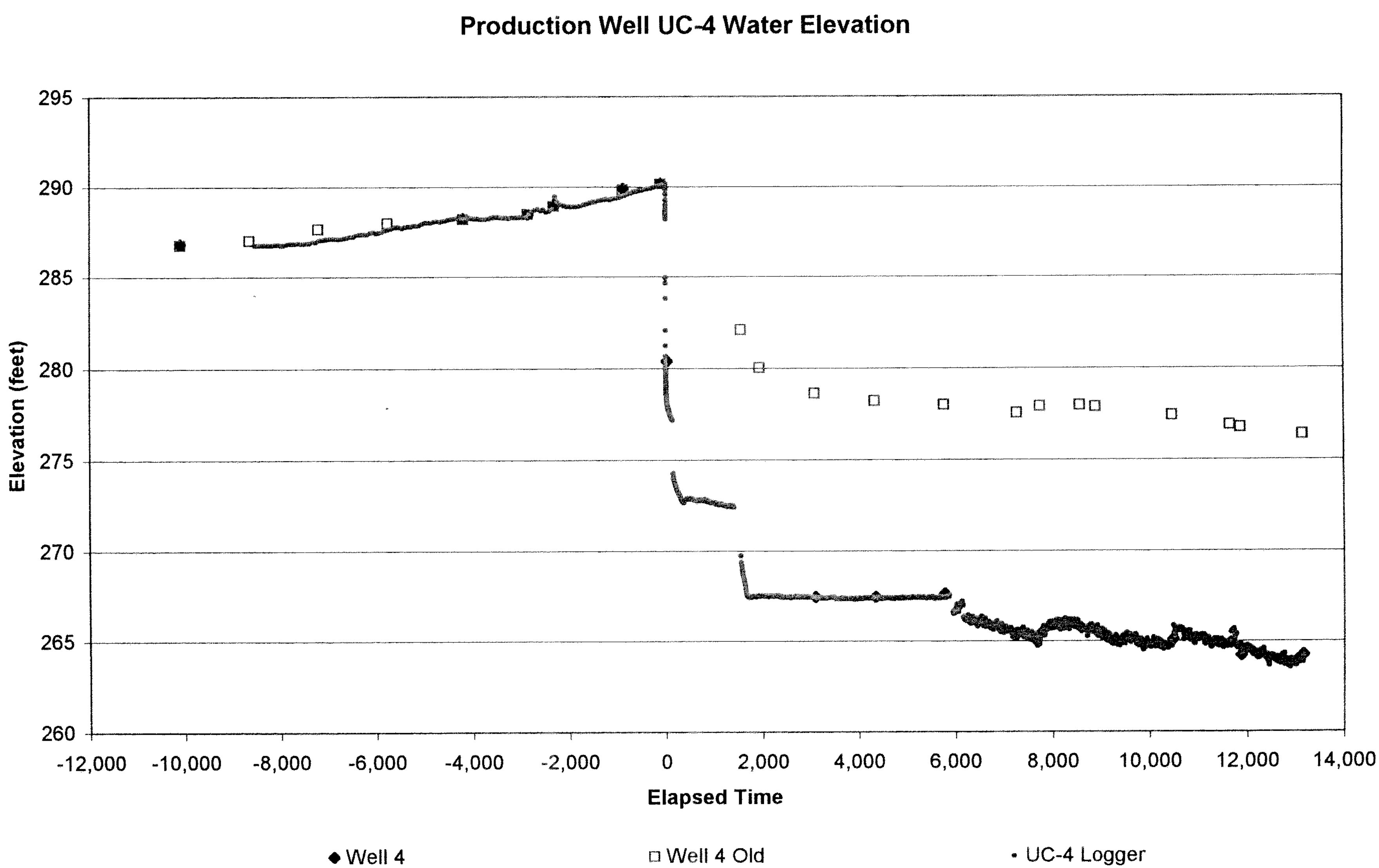
Production Well UC-1 Water Elevation

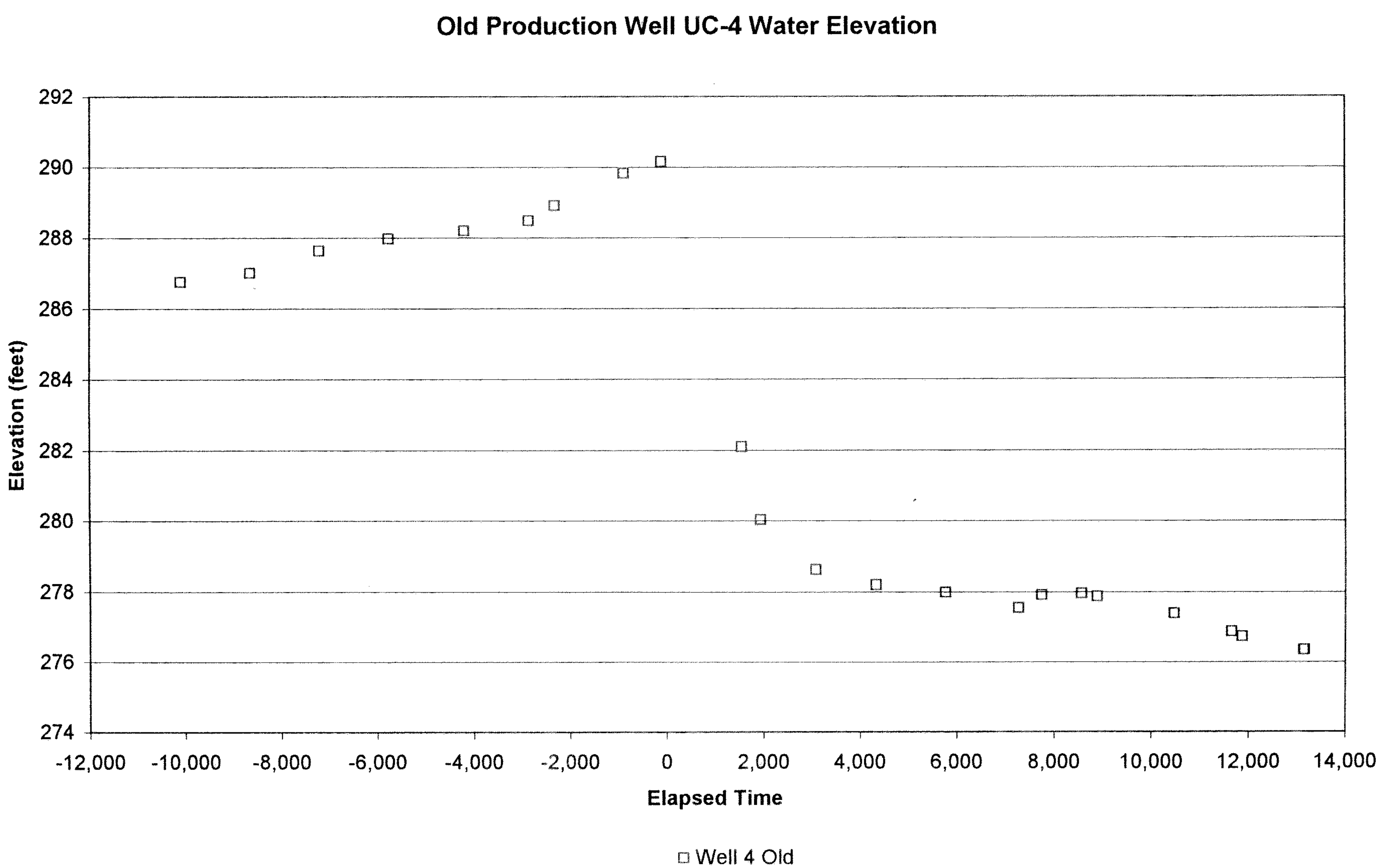



Production Well UC-2 Water Elevation
Elevation (feet)
294
293
292
291
290
289
288
-12,000
-10,000
-8,000
-6,000
-4,000
-2,000
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
Elapsed Time
Well 2
UC-2 Logger

Production Well UC-3 Water Elevation




Production Well UC-4 Water Elevation
Elevation (feet)
295
290
285
280
275
270
265
260
-12,000
-10,000
-8,000
-6,000
-4,000
-2,000
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
Elapsed Time
◆ Well 4
□ Well 4 Old
• UC-4 Logger


Old Production Well UC-4 Water Elevation
Elevation (feet)
292
290
288
286
284
282
280
278
276
274
-12,000
-10,000
-8,000
-6,000
-4,000
-2,000
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
Elapsed Time
Well 4 Old

B

Production Well Data

Date	Time	Elapsed Time	Well 1 DTW	ELEV (ft)	DD (ft)	Totalizer (gallons)	Rate (gpm)
08/11/1999							
08/12/1999	8:00	(10,095)	27.33	286.54			
08/13/1999	8:00	(8,655)	26.20	287.67			
08/14/1999	8:00	(7,215)	25.17	288.70			
08/15/1999	8:00	(5,775)	24.47	289.40			
08/16/1999	9:40	(4,235)	24.1	289.77		90,282,900	0
08/17/1999	8:25	(2,870)	23.69	290.18		90,282,900	0
08/17/1999							
08/18/1999	17:05	(910)	21.99	291.88		90,282,900	0
08/19/1999	6:15	(120)	21.58	292.29		90,282,900	0
08/19/1999							
08/20/1999	9:50	1,535	21.36	292.51		90,282,900	0
08/20/1999							
08/21/1999	11:00	3,045	21.59	292.28		90,282,900	0
08/22/1999	8:35	4,340	21.75	292.12		90,282,900	0
08/23/1999	7:55	5,740	21.86	292.01		90,282,900	0
08/24/1999	8:57	7,242	29.85	284.02		90,655,800	248
08/24/1999							
08/24/1999							
08/25/1999							
08/25/1999	12:00	8,865	31.1	282.77		91,141,600	299
08/26/1999	14:20	10,445	31.70	282.17		91,611,250	297
08/26/1999							
08/27/1999	10:00	11,625	32.35	281.52		91,958,900	295
08/27/1999							
08/28/1999							
08/28/1999	10:55	13,120	32.60	281.27		92,397,640	293

Production Well Data

Date	Time	Elapsed Time	Well 2 DTW	ELEV (ft)	DD (ft)	Totalizer (gallons)	Rate (gpm)
08/11/1999							
08/12/1999	8:00	(10,095)	24.72	288.74			
08/13/1999	8:00	(8,655)	23.90	289.56			
08/14/1999	8:00	(7,215)	23.17	290.29			
08/15/1999	8:00	(5,775)	22.59	290.87			
08/16/1999	9:45	(4,230)	22.3	291.16		98,911,770	0
08/17/1999	8:42	(2,853)	21.97	291.49		98,911,770	0
08/17/1999						98,911,770	0
08/18/1999	17:35	(880)	20.37	293.09		98,911,770	0
08/19/1999	6:00	(135)	20.38	293.08		98,911,770	0
08/19/1999							
08/20/1999	10:00	1,545	20.21	293.25		98,911,770	0
08/20/1999						98,911,770	0
08/21/1999	11:15	3,060	20.37	293.09		98,911,770	0
08/22/1999	8:45	4,350	20.47	292.99		98,911,770	0
08/23/1999	8:00	5,745	20.55	292.91		98,911,770	0
08/24/1999	9:05	7,250	22.6	290.86		98,911,770	0
08/24/1999							
08/24/1999							
08/25/1999							
08/25/1999	12:05	8,870	23.64	289.82		98,911,770	0
08/26/1999	14:30	10,455	24.22	289.24		98,911,770	0
08/26/1999							
08/27/1999	10:05	11,630	24.60	288.86		98,911,770	0
08/27/1999							
08/28/1999							
08/28/1999	11:00	13,125	24.94	288.52		98,911,770	0

Production Well Data

Date	Time	Elapsed Time	Well 3 DTW	ELEV (ft)	DD (ft)	Totalizer (gallons)	Rate (gpm)
08/11/1999							
08/12/1999	8:00	(10,095)	14.70	295.77			
08/13/1999	8:00	(8,655)	13.95	296.52			
08/14/1999	8:00	(7,215)	12.60	297.87			
08/15/1999	8:00	(5,775)					
08/16/1999	8:00	(4,335)					
08/17/1999	9:45	(2,790)				28,269,132	0
08/17/1999						28,269,132	0
08/18/1999	17:25	(890)				28,269,132	0
08/19/1999	7:55	(20)	2.28	308.19		28,269,132	0
08/19/1999							
08/20/1999	8:00	1,425				28,269,132	0
08/20/1999						28,269,132	0
08/21/1999	8:00	2,865				28,269,132	0
08/22/1999	8:00	4,305				28,269,132	0
08/23/1999	8:00	5,745				28,269,132	0
08/24/1999	9:25	7,270				28,653,100	252
08/24/1999							
08/24/1999							
08/25/1999							
08/25/1999	8:00	8,625					
08/26/1999	15:04	10,489	14.46	296.01		29,561,900	282
08/26/1999							
08/27/1999	10:35	11,660				29,891,100	281
08/27/1999							
08/28/1999							
08/28/1999	11:56	13,181	15.33	295.14		30,318,600	281

Production Well Data

Date	Time	Elapsed Time	Well 4 DTW	ELEV (ft)	DD (ft)	Totalizer (gallons)	Avg. Rate (gpm)	Rate (gpm)
08/11/1999								
08/12/1999	8:00	(10,095)	23.10	286.80	3.39			
08/13/1999	8:00	(8,655)						
08/14/1999	8:00	(7,215)						
08/15/1999	8:00	(5,775)						
08/16/1999	10:17	(4,198)	21.67	288.23	1.96	18,055		
08/17/1999	8:30	(2,865)	21.42	288.48	1.71	18,055		
08/17/1999	17:30	(2,325)	20.92	288.98	1.21	18,055		
08/18/1999	17:30	(885)	20.03	289.87	0.32	18,055		
08/19/1999	6:25	(110)	19.71	290.19	0.00			
08/19/1999	8:33	18	29.5	280.40	9.79			290
08/20/1999	10:15	1,560						
08/20/1999	16:40	1,945				696,428		
08/21/1999	11:41	3,086	42.45	267.45	22.74	1,262,656	496	
08/22/1999	8:26	4,331	42.46	267.44	22.75	1,871,146	489	
08/23/1999	8:20	5,765	42.30	267.60	22.59	2,566,734	485	
08/24/1999	9:25	7,270	44.45	265.45	24.74	3,269,004	467	
08/24/1999	16:45	7,710				3,469,632	456	460
08/24/1999	17:30	7,755	44.48	265.42	24.77			
08/25/1999	7:04	8,569	44.16	265.74	24.45	3,810,365	397	404
08/25/1999	12:35	8,900				3,943,083	401	
08/26/1999	14:50	10,475	44.8	265.10	25.09	4,564,514	395	
08/26/1999	15:10	10,495						401
08/27/1999	10:40	11,665	45.00	264.90	25.29	5,034,700	395	
08/27/1999	14:15	11,880	45.70	264.20	25.99			400
08/28/1999	11:27	13,152	45.66	264.24	25.95	5,624,743	397	
08/28/1999	11:30	13,155	45.66	264.24	25.95			

Production Well Data

Date	Time	Elapsed Time	Well 4 Old DTW	ELEV (ft)	DD (ft)
08/11/1999					
08/12/1999	8:00	(10,095)	23.15	286.75	3.40
08/13/1999	8:00	(8,655)	22.90	287.00	3.15
08/14/1999	8:00	(7,215)	22.27	287.63	2.52
08/15/1999	8:00	(5,775)	21.92	287.98	2.17
08/16/1999	10:17	(4,198)	21.7	288.20	1.95
08/17/1999	8:30	(2,865)	21.42	288.48	1.67
08/17/1999	17:30	(2,325)	20.99	288.91	1.24
08/18/1999	17:30	(885)	20.08	289.82	0.33
08/19/1999	6:25	(110)	19.75	290.15	0.00
08/19/1999					
08/20/1999	10:15	1,560	27.80	282.10	8.05
08/20/1999	16:40	1,945	29.87	280.03	10.12
08/21/1999	11:41	3,086	31.27	278.63	11.52
08/22/1999	8:26	4,331	31.7	278.20	11.95
08/23/1999	8:20	5,765	31.92	277.98	12.17
08/24/1999	9:25	7,270	32.35	277.55	12.60
08/24/1999					
08/24/1999	17:30	7,755	31.99	277.91	12.24
08/25/1999	7:04	8,569	31.94	277.96	12.19
08/25/1999	12:35	8,900	32.03	277.87	12.28
08/26/1999	14:50	10,475	32.51	277.39	12.76
08/26/1999	15:10				
08/27/1999	10:40	11,665	33.03	276.87	13.28
08/27/1999	14:15	11,880	33.17	276.73	13.42
08/28/1999	11:27	13,152	33.55	276.35	13.80
08/28/1999	11:30	13,155	33.55	276.35	13.80

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/12/1999	12:05:39	-9,850.00					288.71	4.44	0.00	98,911,770
08/12/1999	12:10:39	-9,845.00					288.73	4.42	0.00	98,911,770
08/12/1999	12:15:39	-9,840.00					288.73	4.42	0.00	98,911,770
08/12/1999	12:20:39	-9,835.00					288.73	4.42	0.00	98,911,770
08/12/1999	12:25:39	-9,830.00					288.74	4.41	0.00	98,911,770
08/12/1999	12:30:39	-9,825.00					288.73	4.42	0.00	98,911,770
08/12/1999	12:35:39	-9,820.00					288.74	4.41	0.00	98,911,770
08/12/1999	12:40:39	-9,815.00	287.04	6.11			288.76	4.39	0.00	98,911,770
08/12/1999	12:45:39	-9,810.00	287.01	6.14			288.76	4.39	0.00	98,911,770
08/12/1999	12:50:39	-9,805.00	286.97	6.19			288.76	4.39	0.00	98,911,770
08/12/1999	12:55:39	-9,800.00	286.92	6.23			288.76	4.39	0.00	98,911,770
08/12/1999	13:00:39	-9,795.00	286.89	6.26			288.76	4.39	0.00	98,911,770
08/12/1999	14:00:39	-9,735.00	287.08	6.07			288.81	4.35	0.00	98,911,770
08/12/1999	15:00:39	-9,675.00	287.11	6.04			288.86	4.30	0.00	98,911,770
08/12/1999	16:00:39	-9,615.00	287.10	6.05			288.89	4.27	0.00	98,911,770
08/12/1999	17:00:39	-9,555.00	287.04	6.11			288.93	4.22	0.00	98,911,770
08/12/1999	18:00:39	-9,495.00	287.00	6.15			288.96	4.19	0.00	98,911,770
08/12/1999	19:00:39	-9,435.00	287.03	6.12			289.00	4.16	0.00	98,911,770
08/12/1999	20:00:39	-9,375.00	287.08	6.07			289.03	4.12	0.00	98,911,770
08/12/1999	21:00:39	-9,315.00	287.09	6.06			289.07	4.08	0.00	98,911,770
08/12/1999	22:00:39	-9,255.00	287.12	6.04			289.11	4.05	0.00	98,911,770
08/12/1999	23:00:39	-9,195.00	287.16	6.00			289.15	4.00	0.00	98,911,770
08/13/1999	0:00:39	-9,135.00	287.34	5.81			289.19	3.97	0.00	98,911,770
08/13/1999	1:00:39	-9,075.00	287.47	5.68			289.22	3.94	0.00	98,911,770
08/13/1999	2:00:39	-9,015.00	287.58	5.57			289.26	3.89	0.00	98,911,770
08/13/1999	3:00:39	-8,955.00	287.66	5.49			289.30	3.86	0.00	98,911,770
08/13/1999	4:00:39	-8,895.00	287.71	5.45			289.34	3.81	0.00	98,911,770
08/13/1999	5:00:39	-8,835.00	287.74	5.41			289.36	3.80	0.00	98,911,770
08/13/1999	6:00:39	-8,775.00	287.70	5.45			289.39	3.76	0.00	98,911,770
08/13/1999	7:00:39	-8,715.00	287.71	5.45			289.42	3.73	0.00	98,911,770
08/13/1999	8:00:39	-8,655.00	287.77	5.38			289.45	3.70	0.00	98,911,770
08/13/1999	9:00:39	-8,595.00	287.73	5.42			289.49	3.67	0.00	98,911,770
08/13/1999	10:00:39	-8,535.00	287.75	5.41			289.52	3.64	0.00	98,911,770
08/13/1999	11:00:39	-8,475.00	287.84	5.31			289.55	3.61	0.00	98,911,770
08/13/1999	12:00:39	-8,415.00	287.78	5.37			289.58	3.57	0.00	98,911,770
08/13/1999	13:00:39	-8,355.00	287.79	5.36			289.61	3.54	0.00	98,911,770
08/13/1999	14:00:39	-8,295.00	287.82	5.33			289.64	3.51	0.00	98,911,770
08/13/1999	15:00:39	-8,235.00	287.85	5.30			289.67	3.48	0.00	98,911,770
08/13/1999	16:00:39	-8,175.00	287.91	5.24			289.70	3.45	0.00	98,911,770
08/13/1999	17:00:39	-8,115.00	287.91	5.24			289.72	3.43	0.00	98,911,770
08/13/1999	18:00:39	-8,055.00	287.91	5.24			289.75	3.40	0.00	98,911,770
08/13/1999	19:00:39	-7,995.00	288.02	5.13			289.78	3.37	0.00	98,911,770
08/13/1999	20:00:39	-7,935.00	288.04	5.12			289.82	3.34	0.00	98,911,770
08/13/1999	21:00:39	-7,875.00	288.08	5.08			289.83	3.32	0.00	98,911,770
08/13/1999	22:00:39	-7,815.00	288.13	5.02			289.86	3.29	0.00	98,911,770
08/13/1999	23:00:39	-7,755.00	288.16	4.99			289.89	3.26	0.00	98,911,770
08/14/1999	0:00:39	-7,695.00	288.24	4.91			289.93	3.23	0.00	98,911,770
08/14/1999	1:00:39	-7,635.00	288.26	4.89			289.94	3.21	0.00	98,911,770
08/14/1999	2:00:39	-7,575.00	288.29	4.86			289.97	3.18	0.00	98,911,770
08/14/1999	3:00:39	-7,515.00	288.34	4.81			290.00	3.15	0.00	98,911,770
08/14/1999	4:00:39	-7,455.00	288.38	4.78			290.04	3.12	0.00	98,911,770
08/14/1999	5:00:39	-7,395.00	288.41	4.74			290.05	3.10	0.00	98,911,770
08/14/1999	6:00:39	-7,335.00	288.43	4.72			290.08	3.07	0.00	98,911,770
08/14/1999	7:00:39	-7,275.00	288.48	4.67			290.10	3.05	0.00	98,911,770
08/14/1999	8:00:39	-7,215.00	288.49	4.66			290.13	3.02	0.00	98,911,770
08/14/1999	9:00:39	-7,155.00	288.56	4.59			290.15	3.01	0.00	98,911,770
08/14/1999	10:00:39	-7,095.00	288.57	4.58			290.16	2.99	0.00	98,911,770
08/14/1999	11:00:39	-7,035.00	288.57	4.58			290.19	2.96	0.00	98,911,770
08/14/1999	12:00:39	-6,975.00	288.62	4.53			290.21	2.94	0.00	98,911,770
08/14/1999	13:00:39	-6,915.00	288.68	4.47			290.24	2.91	0.00	98,911,770
08/14/1999	14:00:39	-6,855.00	288.84	4.31			290.26	2.90	0.00	98,911,770
08/14/1999	15:00:39	-6,795.00	288.78	4.37			290.27	2.88	0.00	98,911,770
08/14/1999	16:00:39	-6,735.00	288.79	4.36			290.30	2.85	0.00	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/14/1999	17:00:39	-6,675.00	288.83	4.32			290.33	2.82	0.00	98,911,770
08/14/1999	18:00:39	-6,615.00	288.86	4.30			290.35	2.80	0.00	98,911,770
08/14/1999	19:00:39	-6,555.00	288.89	4.26			290.37	2.79	0.00	98,911,770
08/14/1999	20:00:39	-6,495.00	288.99	4.16			290.40	2.75	0.00	98,911,770
08/14/1999	21:00:39	-6,435.00	289.01	4.15			290.41	2.74	0.00	98,911,770
08/14/1999	22:00:39	-6,375.00	289.03	4.12			290.44	2.71	0.00	98,911,770
08/14/1999	23:00:39	-6,315.00	289.08	4.07			290.48	2.68	0.00	98,911,770
08/15/1999	0:00:39	-6,255.00	289.13	4.02			290.49	2.66	0.00	98,911,770
08/15/1999	1:00:39	-6,195.00	289.16	4.00			290.52	2.63	0.00	98,911,770
08/15/1999	2:00:39	-6,135.00	289.15	4.00			290.54	2.61	0.00	98,911,770
08/15/1999	3:00:39	-6,075.00	289.19	3.96			290.56	2.60	0.00	98,911,770
08/15/1999	4:00:39	-6,015.00	289.22	3.93			290.59	2.57	0.00	98,911,770
08/15/1999	5:00:39	-5,955.00	289.26	3.90			290.60	2.55	0.00	98,911,770
08/15/1999	6:00:39	-5,895.00	289.27	3.88			290.62	2.54	0.00	98,911,770
08/15/1999	7:00:39	-5,835.00	289.32	3.83			290.65	2.50	0.00	98,911,770
08/15/1999	8:00:39	-5,775.00	289.40	3.75			290.67	2.49	0.00	98,911,770
08/15/1999	9:00:39	-5,715.00	289.45	3.71			290.68	2.47	0.00	98,911,770
08/15/1999	10:00:39	-5,655.00	289.46	3.70			290.70	2.46	0.00	98,911,770
08/15/1999	11:00:39	-5,595.00	289.49	3.67			290.71	2.44	0.00	98,911,770
08/15/1999	12:00:39	-5,535.00	289.50	3.65			290.73	2.42	0.00	98,911,770
08/15/1999	13:00:39	-5,475.00	289.52	3.63			290.76	2.39	0.00	98,911,770
08/15/1999	14:00:39	-5,415.00	289.55	3.60			290.76	2.39	0.00	98,911,770
08/15/1999	15:00:39	-5,355.00	289.58	3.57			290.79	2.36	0.00	98,911,770
08/15/1999	16:00:39	-5,295.00	289.57	3.58			290.81	2.35	0.00	98,911,770
08/15/1999	17:00:39	-5,235.00	289.63	3.52			290.82	2.33	0.00	98,911,770
08/15/1999	18:00:39	-5,175.00	289.60	3.56			290.86	2.30	0.00	98,911,770
08/15/1999	19:00:39	-5,115.00	289.61	3.54			290.87	2.28	0.00	98,911,770
08/15/1999	20:00:39	-5,055.00	289.63	3.52			290.89	2.27	0.00	98,911,770
08/15/1999	21:00:39	-4,995.00	289.67	3.48			290.90	2.25	0.00	98,911,770
08/15/1999	22:00:39	-4,935.00	289.65	3.50			290.92	2.24	0.00	98,911,770
08/15/1999	23:00:39	-4,875.00	289.65	3.50			290.95	2.21	0.00	98,911,770
08/16/1999	0:00:39	-4,815.00	289.68	3.47			290.95	2.21	0.00	98,911,770
08/16/1999	1:00:39	-4,755.00	289.71	3.44			290.98	2.17	0.00	98,911,770
08/16/1999	2:00:39	-4,695.00	289.75	3.41			291.00	2.16	0.00	98,911,770
08/16/1999	3:00:39	-4,635.00	289.78	3.37			291.01	2.14	0.00	98,911,770
08/16/1999	4:00:39	-4,575.00	289.79	3.36			291.04	2.11	0.00	98,911,770
08/16/1999	5:00:39	-4,515.00	289.85	3.30			291.04	2.11	0.00	98,911,770
08/16/1999	6:00:39	-4,455.00	289.85	3.30			291.07	2.08	0.00	98,911,770
08/16/1999	7:00:39	-4,395.00	289.89	3.27			291.09	2.06	0.00	98,911,770
08/16/1999	8:00:39	-4,335.00	289.89	3.27			291.11	2.05	0.00	98,911,770
08/16/1999	9:00:39	-4,275.00	289.93	3.22			291.11	2.05	0.00	98,911,770
08/16/1999	10:00:39	-4,215.00	289.90	3.26	0.00	90,282,900	291.14	2.02	0.00	98,911,770
08/16/1999	11:00:39	-4,155.00	289.92	3.23	0.00	90,282,900	291.14	2.02	0.00	98,911,770
08/16/1999	12:00:39	-4,095.00	289.93	3.22	0.00	90,282,900	291.15	2.00	0.00	98,911,770
08/16/1999	13:00:39	-4,035.00	289.94	3.22	0.00	90,282,900	291.17	1.98	0.00	98,911,770
08/16/1999	14:00:39	-3,975.00	289.97	3.18	0.00	90,282,900	291.19	1.97	0.00	98,911,770
08/16/1999	15:00:39	-3,915.00	290.01	3.14	0.00	90,282,900	291.20	1.95	0.00	98,911,770
08/16/1999	16:00:39	-3,855.00	290.02	3.13	0.00	90,282,900	291.22	1.94	0.00	98,911,770
08/16/1999	17:00:39	-3,795.00	290.05	3.11	0.00	90,282,900	291.23	1.92	0.00	98,911,770
08/16/1999	18:00:39	-3,735.00	290.06	3.09	0.00	90,282,900	291.25	1.91	0.00	98,911,770
08/16/1999	19:00:39	-3,675.00	290.06	3.09	0.00	90,282,900	291.25	1.91	0.00	98,911,770
08/16/1999	20:00:39	-3,615.00	290.11	3.04	0.00	90,282,900	291.26	1.89	0.00	98,911,770
08/16/1999	21:00:39	-3,555.00	290.12	3.04	0.00	90,282,900	291.28	1.87	0.00	98,911,770
08/16/1999	22:00:39	-3,495.00	290.16	3.00	0.00	90,282,900	291.30	1.86	0.00	98,911,770
08/16/1999	23:00:39	-3,435.00	290.20	2.96	0.00	90,282,900	291.31	1.84	0.00	98,911,770
08/17/1999	0:00:39	-3,375.00	290.19	2.97	0.00	90,282,900	291.33	1.83	0.00	98,911,770
08/17/1999	1:00:39	-3,315.00	290.20	2.95	0.00	90,282,900	291.34	1.81	0.00	98,911,770
08/17/1999	2:00:39	-3,255.00	290.23	2.93	0.00	90,282,900	291.36	1.79	0.00	98,911,770
08/17/1999	3:00:39	-3,195.00	290.27	2.89	0.00	90,282,900	291.36	1.79	0.00	98,911,770
08/17/1999	4:00:39	-3,135.00	290.32	2.83	0.00	90,282,900	291.39	1.76	0.00	98,911,770
08/17/1999	5:00:39	-3,075.00	290.37	2.78	0.00	90,282,900	291.40	1.75	0.00	98,911,770
08/17/1999	6:00:39	-3,015.00	290.38	2.78	0.00	90,282,900	291.42	1.73	0.00	98,911,770
08/17/1999	7:00:39	-2,955.00	290.40	2.75	0.00	90,282,900	291.44	1.72	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/17/1999	8:00:39	-2,895.00	290.42	2.73	0.00	90,282,900	291.47	1.68	0.00	98,911,770
08/17/1999	9:00:39	-2,835.00	290.47	2.68	0.00	90,282,900	291.52	1.64	0.00	98,911,770
08/17/1999	10:00:39	-2,775.00	290.53	2.62	0.00	90,282,900	291.56	1.59	0.00	98,911,770
08/17/1999	11:00:39	-2,715.00	290.57	2.59	0.00	90,282,900	291.63	1.53	0.00	98,911,770
08/17/1999	12:00:39	-2,655.00	290.63	2.52	0.00	90,282,900	291.67	1.48	0.00	98,911,770
08/17/1999	13:00:39	-2,595.00	290.70	2.45	0.00	90,282,900	291.72	1.43	0.00	98,911,770
08/17/1999	14:00:39	-2,535.00	290.78	2.37	0.00	90,282,900	291.78	1.37	0.00	98,911,770
08/17/1999	15:00:39	-2,475.00	290.85	2.30	0.00	90,282,900	291.82	1.34	0.00	98,911,770
08/17/1999	16:00:39	-2,415.00	290.91	2.24	0.00	90,282,900	291.86	1.29	0.00	98,911,770
08/17/1999	17:00:39	-2,355.00	290.93	2.22	0.00	90,282,900	291.91	1.24	0.00	98,911,770
08/17/1999	18:00:39	-2,295.00	290.98	2.17	0.00	90,282,900	291.96	1.20	0.00	98,911,770
08/17/1999	19:00:39	-2,235.00	291.04	2.11	0.00	90,282,900	292.00	1.15	0.00	98,911,770
08/17/1999	20:00:39	-2,175.00	291.12	2.04	0.00	90,282,900	292.04	1.12	0.00	98,911,770
08/17/1999	21:00:39	-2,115.00	291.16	1.99	0.00	90,282,900	292.08	1.07	0.00	98,911,770
08/17/1999	22:00:39	-2,055.00	291.25	1.90	0.00	90,282,900	292.12	1.04	0.00	98,911,770
08/17/1999	23:00:39	-1,995.00	291.34	1.81	0.00	90,282,900	292.16	0.99	0.00	98,911,770
08/18/1999	0:00:39	-1,935.00	291.40	1.75	0.00	90,282,900	292.21	0.94	0.00	98,911,770
08/18/1999	1:00:39	-1,875.00	291.46	1.70	0.00	90,282,900	292.24	0.91	0.00	98,911,770
08/18/1999	2:00:39	-1,815.00	291.53	1.62	0.00	90,282,900	292.29	0.87	0.00	98,911,770
08/18/1999	3:00:39	-1,755.00	291.61	1.54	0.00	90,282,900	292.32	0.84	0.00	98,911,770
08/18/1999	4:00:39	-1,695.00	291.65	1.50	0.00	90,282,900	292.35	0.80	0.00	98,911,770
08/18/1999	5:00:39	-1,635.00	293.57	-0.42	0.00	90,282,900	292.40	0.75	0.00	98,911,770
08/18/1999	6:00:39	-1,575.00	292.68	0.47	0.00	90,282,900	292.43	0.72	0.00	98,911,770
08/18/1999	7:00:39	-1,515.00	292.43	0.72	0.00	90,282,900	292.46	0.69	0.00	98,911,770
08/18/1999	8:00:39	-1,455.00	292.36	0.79	0.00	90,282,900	292.49	0.66	0.00	98,911,770
08/18/1999	9:00:39	-1,395.00	292.25	0.90	0.00	90,282,900	292.52	0.63	0.00	98,911,770
08/18/1999	10:00:39	-1,335.00	292.09	1.07	0.00	90,282,900	292.57	0.58	0.00	98,911,770
08/18/1999	11:00:39	-1,275.00	291.93	1.22	0.00	90,282,900	292.60	0.55	0.00	98,911,770
08/18/1999	12:00:39	-1,215.00	291.97	1.18	0.00	90,282,900	292.63	0.52	0.00	98,911,770
08/18/1999	13:00:39	-1,155.00	292.02	1.13	0.00	90,282,900	292.67	0.49	0.00	98,911,770
08/18/1999	14:00:39	-1,095.00	292.03	1.12	0.00	90,282,900	292.70	0.46	0.00	98,911,770
08/18/1999	15:00:39	-1,035.00	292.09	1.07	0.00	90,282,900	292.73	0.42	0.00	98,911,770
08/18/1999	16:00:39	-975.00	292.10	1.05	0.00	90,282,900	292.75	0.41	0.00	98,911,770
08/18/1999	17:00:39	-915.00	292.12	1.03	0.00	90,282,900	292.78	0.38	0.00	98,911,770
08/18/1999	18:00:39	-855.00	292.16	1.00	0.00	90,282,900	292.79	0.36	0.00	98,911,770
08/18/1999	19:00:39	-795.00	292.21	0.94	0.00	90,282,900	292.82	0.33	0.00	98,911,770
08/18/1999	20:00:39	-735.00	292.22	0.93	0.00	90,282,900	292.86	0.30	0.00	98,911,770
08/18/1999	21:00:39	-675.00	292.24	0.91	0.00	90,282,900	292.87	0.28	0.00	98,911,770
08/18/1999	22:00:39	-615.00	292.28	0.87	0.00	90,282,900	292.90	0.25	0.00	98,911,770
08/18/1999	23:00:39	-555.00	292.30	0.85	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/19/1999	0:00:39	-495.00	292.35	0.80	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/19/1999	1:00:39	-435.00	292.36	0.79	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/19/1999	2:00:39	-375.00	292.40	0.75	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/19/1999	3:00:39	-315.00	292.45	0.70	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/19/1999	4:00:39	-255.00	292.46	0.69	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/19/1999	5:00:39	-195.00	292.45	0.70	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/19/1999	6:00:39	-135.00	292.50	0.65	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/19/1999	7:00:39	-75.00	292.58	0.57	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/19/1999	8:00:15	-15.00	292.57	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	8:05:15	-10.00	292.55	0.60	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/19/1999	8:10:15	-5.00	292.51	0.64	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/19/1999	8:15:15	0.00	293.15	0.00	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	8:20:15	5.00	293.12	0.03	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	8:25:15	10.00	293.10	0.06	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	8:30:15	15.00	293.07	0.08	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	8:35:15	20.00	293.14	0.02	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	8:40:15	25.00	293.02	0.13	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	8:45:15	30.00	292.96	0.20	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	8:50:15	35.00	292.93	0.22	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	8:55:15	40.00	292.91	0.24	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	9:00:15	45.00	292.90	0.25	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	9:05:15	50.00	292.92	0.23	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	9:10:15	55.00	292.92	0.23	0.00	90,282,900	293.17	-0.02	0.00	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/19/1999	9:15:15	60.00	292.90	0.25	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	9:20:15	65.00	292.90	0.25	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	9:25:15	70.00	292.88	0.27	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	9:30:15	75.00	292.88	0.28	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/19/1999	9:35:15	80.00	292.88	0.28	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	9:40:15	85.00	292.87	0.28	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	9:45:15	90.00	292.87	0.28	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	9:50:15	95.00	292.87	0.28	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	9:55:15	100.00	292.87	0.28	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:00:15	105.00	292.87	0.28	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:05:15	110.00	292.86	0.29	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:10:15	115.00	292.86	0.29	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:15:15	120.00	292.86	0.29	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:20:15	125.00	292.86	0.29	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:25:15	130.00	292.85	0.30	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:30:15	135.00	292.85	0.30	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:35:15	140.00	292.85	0.30	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:40:15	145.00	292.85	0.31	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:45:15	150.00	292.85	0.31	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:50:15	155.00	292.84	0.32	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	10:55:15	160.00	292.84	0.32	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	11:00:15	165.00	292.85	0.31	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	11:05:15	170.00	292.84	0.32	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	11:10:15	175.00	292.84	0.32	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	11:15:15	180.00	292.84	0.32	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	11:20:15	185.00	292.81	0.34	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	11:25:15	190.00	292.81	0.34	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	11:30:15	195.00	292.81	0.34	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	11:35:15	200.00	292.81	0.35	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	11:40:15	205.00	292.81	0.35	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	11:45:15	210.00	292.81	0.35	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	11:50:15	215.00	292.81	0.35	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/19/1999	11:55:15	220.00	292.80	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:00:15	225.00	292.81	0.35	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:05:15	230.00	292.81	0.35	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:10:15	235.00	292.80	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:15:15	240.00	292.79	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:20:15	245.00	292.79	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:25:15	250.00	292.79	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:30:15	255.00	292.79	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:35:15	260.00	292.79	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:40:15	265.00	292.78	0.37	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:45:15	270.00	292.79	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:50:15	275.00	292.78	0.37	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	12:55:15	280.00	292.78	0.37	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:00:15	285.00	292.78	0.37	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:05:15	290.00	292.78	0.37	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:10:15	295.00	292.77	0.38	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:15:15	300.00	292.77	0.38	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:20:15	305.00	292.77	0.38	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:25:15	310.00	292.78	0.37	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:30:15	315.00	292.77	0.39	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:35:15	320.00	292.77	0.38	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	13:40:15	325.00	292.88	0.28	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	13:45:15	330.00	292.87	0.28	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:50:15	335.00	292.81	0.34	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	13:55:15	340.00	292.80	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	14:00:15	345.00	292.80	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	14:05:15	350.00	292.79	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	14:10:15	355.00	292.79	0.36	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	14:15:15	360.00	292.78	0.37	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	14:20:15	365.00	292.78	0.37	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	14:25:15	370.00	292.78	0.37	0.00	90,282,900	293.20	-0.05	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/19/1999	14:30:15	375.00	292.77	0.38	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	14:35:15	380.00	292.77	0.38	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	14:40:15	385.00	292.77	0.38	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	14:45:15	390.00	292.77	0.38	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	14:50:15	395.00	292.76	0.39	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	14:55:15	400.00	292.75	0.40	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	15:00:15	405.00	292.76	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	15:05:15	410.00	292.75	0.40	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	15:10:15	415.00	292.76	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	15:15:15	420.00	292.76	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	15:20:15	425.00	292.76	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	15:25:15	430.00	292.76	0.39	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	15:30:15	435.00	292.75	0.40	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	15:35:15	440.00	292.75	0.40	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	15:40:15	445.00	292.75	0.40	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	15:45:15	450.00	292.75	0.40	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	15:50:15	455.00	292.76	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	15:55:15	460.00	292.75	0.40	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	16:00:15	465.00	292.75	0.40	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	16:05:15	470.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	16:10:15	475.00	292.74	0.41	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	16:15:15	480.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	16:20:15	485.00	292.74	0.41	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	16:25:15	490.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	16:30:15	495.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	16:35:15	500.00	292.74	0.41	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	16:40:15	505.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	16:45:15	510.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	16:50:15	515.00	292.74	0.41	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	16:55:15	520.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	17:00:15	525.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	17:05:15	530.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	17:10:15	535.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	17:15:15	540.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	17:20:15	545.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	17:25:15	550.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	17:30:15	555.00	292.74	0.41	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	17:35:15	560.00	292.74	0.41	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	17:40:15	565.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	17:45:15	570.00	292.74	0.41	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	17:50:15	575.00	292.74	0.41	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	17:55:15	580.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:00:15	585.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	18:05:15	590.00	292.85	0.31	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:10:15	595.00	292.75	0.40	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:15:15	600.00	292.84	0.32	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:20:15	605.00	292.83	0.32	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:25:15	610.00	292.77	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:30:15	615.00	292.77	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:35:15	620.00	292.76	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:40:15	625.00	292.76	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:45:15	630.00	292.74	0.41	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:50:15	635.00	292.74	0.41	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	18:55:15	640.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	19:00:15	645.00	292.74	0.41	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	19:05:15	650.00	292.74	0.41	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	19:10:15	655.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	19:15:15	660.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	19:20:15	665.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	19:25:15	670.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	19:30:15	675.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	19:35:15	680.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	19:40:15	685.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/19/1999	19:45:15	690.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	19:50:15	695.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	19:55:15	700.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	20:00:15	705.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	20:05:15	710.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	20:10:15	715.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	20:15:15	720.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	20:20:15	725.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	20:25:15	730.00	292.72	0.43	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	20:30:15	735.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	20:35:15	740.00	292.72	0.43	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	20:40:15	745.00	292.72	0.43	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	20:45:15	750.00	292.73	0.42	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	20:50:15	755.00	292.72	0.43	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	20:55:15	760.00	292.72	0.43	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/19/1999	21:00:15	765.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:05:15	770.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:10:15	775.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:15:15	780.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:20:15	785.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:25:15	790.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:30:15	795.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:35:15	800.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:40:15	805.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:45:15	810.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:50:15	815.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	21:55:15	820.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:00:15	825.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:05:15	830.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:10:15	835.00	292.78	0.37	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:15:15	840.00	292.77	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:20:15	845.00	292.78	0.37	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:25:15	850.00	292.77	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:30:15	855.00	292.76	0.39	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:35:15	860.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/19/1999	22:40:15	865.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:45:15	870.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:50:15	875.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	22:55:15	880.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	23:00:15	885.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	23:05:15	890.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/19/1999	23:10:15	895.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	23:15:15	900.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	23:20:15	905.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	23:25:15	910.00	292.71	0.44	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	23:30:15	915.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/19/1999	23:35:15	920.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/19/1999	23:40:15	925.00	292.71	0.44	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/19/1999	23:45:15	930.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/19/1999	23:50:15	935.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/19/1999	23:55:15	940.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:00:15	945.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:05:15	950.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:10:15	955.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:15:15	960.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:20:15	965.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:25:15	970.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:30:15	975.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:35:15	980.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:40:15	985.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:45:15	990.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:50:15	995.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	0:55:15	1,000.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/20/1999	1:00:15	1,005.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:05:15	1,010.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:10:15	1,015.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:15:15	1,020.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:20:15	1,025.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:25:15	1,030.00	292.72	0.43	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	1:30:15	1,035.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:35:15	1,040.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:40:15	1,045.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:45:15	1,050.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:50:15	1,055.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	1:55:15	1,060.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:00:15	1,065.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:05:15	1,070.00	292.74	0.41	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:10:15	1,075.00	292.77	0.39	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:15:15	1,080.00	292.74	0.41	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:20:15	1,085.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:25:15	1,090.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:30:15	1,095.00	292.74	0.41	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:35:15	1,100.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:40:15	1,105.00	292.74	0.41	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:45:15	1,110.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:50:15	1,115.00	292.74	0.41	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	2:55:15	1,120.00	292.79	0.36	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:00:15	1,125.00	292.77	0.39	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:05:15	1,130.00	292.76	0.39	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:10:15	1,135.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:15:15	1,140.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:20:15	1,145.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:25:15	1,150.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:30:15	1,155.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:35:15	1,160.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:40:15	1,165.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:45:15	1,170.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:50:15	1,175.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	3:55:15	1,180.00	292.72	0.43	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	4:00:15	1,185.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	4:05:15	1,190.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	4:10:15	1,195.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	4:15:15	1,200.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	4:20:15	1,205.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	4:25:15	1,210.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	4:30:15	1,215.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	4:35:15	1,220.00	292.72	0.43	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	4:40:15	1,225.00	292.72	0.43	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	4:45:15	1,230.00	292.73	0.42	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	4:50:15	1,235.00	292.73	0.42	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	4:55:15	1,240.00	292.73	0.42	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	5:00:15	1,245.00	292.73	0.42	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	5:05:15	1,250.00	292.72	0.43	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	5:10:15	1,255.00	292.72	0.43	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	5:15:15	1,260.00	292.72	0.43	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	5:20:15	1,265.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	5:25:15	1,270.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	5:30:15	1,275.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	5:35:15	1,280.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	5:40:15	1,285.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	5:45:15	1,290.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	5:50:15	1,295.00	292.73	0.42	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	5:55:15	1,300.00	292.72	0.43	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	6:00:15	1,305.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:05:15	1,310.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:10:15	1,315.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/20/1999	6:15:15	1,320.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:20:15	1,325.00	292.72	0.43	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:25:15	1,330.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:30:15	1,335.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:35:15	1,340.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:40:15	1,345.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:45:15	1,350.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:50:15	1,355.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	6:55:15	1,360.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	7:00:15	1,365.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	7:05:15	1,370.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	7:10:15	1,375.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	7:15:15	1,380.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	7:20:15	1,385.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	7:25:15	1,390.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	7:30:15	1,395.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	7:35:15	1,400.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	7:40:15	1,405.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	7:45:15	1,410.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	7:50:15	1,415.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	7:55:15	1,420.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	8:00:15	1,425.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	8:05:15	1,430.00	292.72	0.43	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	8:10:15	1,435.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	8:15:15	1,440.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	8:20:15	1,445.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	8:25:15	1,450.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	8:30:15	1,455.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	8:35:15	1,460.00	292.70	0.45	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	8:40:15	1,465.00	292.70	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	8:45:15	1,470.00	292.70	0.45	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	8:50:15	1,475.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	8:55:15	1,480.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	9:00:15	1,485.00	292.69	0.46	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	9:05:15	1,490.00	292.70	0.46	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	9:10:15	1,495.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	9:15:15	1,500.00	292.70	0.46	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	9:20:15	1,505.00	292.70	0.45	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	9:25:15	1,510.00	292.70	0.45	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	9:30:15	1,515.00	292.73	0.42	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	9:35:15	1,520.00	292.73	0.42	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	9:40:15	1,525.00	292.73	0.42	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	9:45:15	1,530.00	292.73	0.42	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	9:50:15	1,535.00	292.70	0.45	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	9:55:15	1,540.00	292.70	0.45	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:00:15	1,545.00	292.71	0.44	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:05:15	1,550.00	292.70	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:10:15	1,555.00	292.70	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:15:15	1,560.00	292.70	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:20:15	1,565.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:25:15	1,570.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:30:15	1,575.00	292.70	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:35:15	1,580.00	292.70	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:40:15	1,585.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:45:15	1,590.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:50:15	1,595.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	10:55:15	1,600.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:00:15	1,605.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:05:15	1,610.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:10:15	1,615.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:15:15	1,620.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:20:15	1,625.00	292.69	0.46	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	11:25:15	1,630.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/20/1999	11:30:15	1,635.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:35:15	1,640.00	292.70	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:40:15	1,645.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:45:15	1,650.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:50:15	1,655.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	11:55:15	1,660.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:00:15	1,665.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:05:15	1,670.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:10:15	1,675.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:15:15	1,680.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:20:15	1,685.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:25:15	1,690.00	292.70	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:30:15	1,695.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:35:15	1,700.00	292.68	0.47	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	12:40:15	1,705.00	292.69	0.46	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	12:45:15	1,710.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:50:15	1,715.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	12:55:15	1,720.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	13:00:15	1,725.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	13:05:15	1,730.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	13:10:15	1,735.00	292.69	0.46	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	13:15:15	1,740.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	13:20:15	1,745.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	13:25:15	1,750.00	292.67	0.48	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	13:30:15	1,755.00	292.67	0.48	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	13:35:15	1,760.00	292.68	0.47	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	13:40:15	1,765.00	292.68	0.47	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	13:45:15	1,770.00	292.67	0.48	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	13:50:15	1,775.00	292.67	0.48	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	13:55:15	1,780.00	292.67	0.48	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:00:15	1,785.00	292.67	0.48	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:05:15	1,790.00	292.67	0.48	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:10:15	1,795.00	292.68	0.47	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:15:15	1,800.00	292.68	0.47	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:20:15	1,805.00	292.68	0.47	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:25:15	1,810.00	292.68	0.47	0.00	90,282,900	293.23	-0.08	0.00	98,911,770
08/20/1999	14:30:15	1,815.00	292.68	0.47	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:35:15	1,820.00	292.68	0.47	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:40:15	1,825.00	292.69	0.46	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:45:15	1,830.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:50:15	1,835.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	14:55:15	1,840.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	15:00:15	1,845.00	292.70	0.45	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	15:05:15	1,850.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	15:10:15	1,855.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	15:15:15	1,860.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	15:20:15	1,865.00	292.70	0.45	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	15:25:15	1,870.00	292.71	0.44	0.00	90,282,900	293.22	-0.06	0.00	98,911,770
08/20/1999	15:30:15	1,875.00	292.72	0.43	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	15:35:15	1,880.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	15:40:15	1,885.00	292.73	0.42	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	15:45:15	1,890.00	292.71	0.44	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	15:50:15	1,895.00	292.71	0.44	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	15:55:15	1,900.00	292.70	0.46	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:00:15	1,905.00	292.70	0.46	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:05:15	1,910.00	292.70	0.46	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:10:15	1,915.00	292.69	0.46	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:15:15	1,920.00	292.71	0.44	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:20:15	1,925.00	292.71	0.44	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:25:15	1,930.00	292.71	0.44	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:30:15	1,935.00	292.69	0.46	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:35:15	1,940.00	292.69	0.46	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:40:15	1,945.00	292.68	0.47	0.00	90,282,900	293.20	-0.05	0.00	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/20/1999	16:45:15	1,950.00	292.68	0.47	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:50:15	1,955.00	292.67	0.48	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	16:55:15	1,960.00	292.66	0.49	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	17:00:15	1,965.00	292.66	0.49	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	17:05:15	1,970.00	292.66	0.49	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	17:10:15	1,975.00	292.66	0.49	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	17:15:15	1,980.00	292.66	0.49	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	17:20:15	1,985.00	292.66	0.50	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	17:25:15	1,990.00	292.66	0.50	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	17:30:15	1,995.00	292.66	0.50	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	17:35:15	2,000.00	292.66	0.50	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	17:40:15	2,005.00	292.66	0.50	0.00	90,282,900	293.20	-0.05	0.00	98,911,770
08/20/1999	17:45:15	2,010.00	292.66	0.50	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	17:50:15	2,015.00	292.65	0.51	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	17:55:15	2,020.00	292.65	0.51	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:00:15	2,025.00	292.64	0.51	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:05:15	2,030.00	292.64	0.51	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:10:15	2,035.00	292.64	0.51	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:15:15	2,040.00	292.64	0.51	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:20:15	2,045.00	292.63	0.52	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:25:15	2,050.00	292.63	0.52	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:30:15	2,055.00	292.62	0.53	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:35:15	2,060.00	292.62	0.53	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:40:15	2,065.00	292.63	0.52	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:45:15	2,070.00	292.63	0.52	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:50:15	2,075.00	292.62	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	18:55:15	2,080.00	292.62	0.53	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:00:15	2,085.00	292.62	0.53	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:05:15	2,090.00	292.61	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:10:15	2,095.00	292.61	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:15:15	2,100.00	292.62	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:20:15	2,105.00	292.62	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:25:15	2,110.00	292.62	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:30:15	2,115.00	292.62	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:35:15	2,120.00	292.61	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:40:15	2,125.00	292.61	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:45:15	2,130.00	292.61	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:50:15	2,135.00	292.61	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	19:55:15	2,140.00	292.61	0.54	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	20:00:15	2,145.00	292.60	0.55	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	20:05:15	2,150.00	292.59	0.56	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	20:10:15	2,155.00	292.60	0.55	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	20:15:15	2,160.00	292.59	0.56	0.00	90,282,900	293.19	-0.03	0.00	98,911,770
08/20/1999	20:20:15	2,165.00	292.59	0.56	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	20:25:15	2,170.00	292.59	0.56	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	20:30:15	2,175.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	20:35:15	2,180.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	20:40:15	2,185.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	20:45:15	2,190.00	292.57	0.58	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	20:50:15	2,195.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	20:55:15	2,200.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	21:00:15	2,205.00	292.57	0.58	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	21:05:15	2,210.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	21:10:15	2,215.00	292.57	0.58	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	21:15:15	2,220.00	292.56	0.59	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	21:20:15	2,225.00	292.56	0.59	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	21:25:15	2,230.00	292.56	0.59	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	21:30:15	2,235.00	292.55	0.60	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	21:35:15	2,240.00	292.55	0.61	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	21:40:15	2,245.00	292.54	0.61	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	21:45:15	2,250.00	292.55	0.61	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	21:50:15	2,255.00	292.55	0.61	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	21:55:15	2,260.00	292.55	0.61	0.00	90,282,900	293.15	0.00	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/20/1999	22:00:15	2,265.00	292.55	0.61	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:05:15	2,270.00	292.55	0.60	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	22:10:15	2,275.00	292.55	0.60	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:15:15	2,280.00	292.55	0.60	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:20:15	2,285.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:25:15	2,290.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:30:15	2,295.00	292.57	0.58	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:35:15	2,300.00	292.58	0.57	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:40:15	2,305.00	292.58	0.57	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:45:15	2,310.00	292.57	0.58	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:50:15	2,315.00	292.58	0.57	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	22:55:15	2,320.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	23:00:15	2,325.00	292.58	0.57	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	23:05:15	2,330.00	292.58	0.57	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	23:10:15	2,335.00	292.58	0.57	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	23:15:15	2,340.00	292.59	0.56	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	23:20:15	2,345.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	23:25:15	2,350.00	292.59	0.56	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	23:30:15	2,355.00	292.59	0.56	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	23:35:15	2,360.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	23:40:15	2,365.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	23:45:15	2,370.00	292.58	0.57	0.00	90,282,900	293.17	-0.02	0.00	98,911,770
08/20/1999	23:50:15	2,375.00	292.57	0.58	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/20/1999	23:55:15	2,380.00	292.57	0.58	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:00:15	2,385.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:05:15	2,390.00	292.57	0.58	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:10:15	2,395.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:15:15	2,400.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:20:15	2,405.00	292.57	0.58	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:25:15	2,410.00	292.57	0.58	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:30:15	2,415.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:35:15	2,420.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:40:15	2,425.00	292.55	0.60	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:45:15	2,430.00	292.55	0.60	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:50:15	2,435.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	0:55:15	2,440.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	1:00:15	2,445.00	292.55	0.60	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	1:05:15	2,450.00	292.55	0.60	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	1:10:15	2,455.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	1:15:15	2,460.00	292.55	0.60	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	1:20:15	2,465.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	1:25:15	2,470.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	1:30:15	2,475.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	1:35:15	2,480.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	1:40:15	2,485.00	292.55	0.60	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	1:45:15	2,490.00	292.55	0.61	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	1:50:15	2,495.00	292.55	0.60	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	1:55:15	2,500.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:00:15	2,505.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:05:15	2,510.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:10:15	2,515.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:15:15	2,520.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	2:20:15	2,525.00	292.56	0.59	0.00	90,282,900	293.15	0.00	0.00	98,911,770
08/21/1999	2:25:15	2,530.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:30:15	2,535.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:35:15	2,540.00	292.55	0.60	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:40:15	2,545.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:45:15	2,550.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:50:15	2,555.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	2:55:15	2,560.00	292.55	0.60	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	3:00:15	2,565.00	292.55	0.60	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	3:05:15	2,570.00	292.55	0.60	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	3:10:15	2,575.00	292.57	0.58	0.00	90,282,900	293.14	0.02	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/21/1999	3:15:15	2,580.00	292.56	0.59	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	3:20:15	2,585.00	292.55	0.60	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	3:25:15	2,590.00	292.55	0.61	0.00	90,282,900	293.14	0.02	0.00	98,911,770
08/21/1999	3:30:15	2,595.00	292.55	0.61	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	3:35:15	2,600.00	292.55	0.61	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	3:40:15	2,605.00	292.55	0.60	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	3:45:15	2,610.00	292.55	0.61	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	3:50:15	2,615.00	292.55	0.61	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	3:55:15	2,620.00	292.55	0.61	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:00:15	2,625.00	292.55	0.60	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:05:15	2,630.00	292.55	0.61	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:10:15	2,635.00	292.54	0.61	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:15:15	2,640.00	292.53	0.62	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:20:15	2,645.00	292.54	0.61	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:25:15	2,650.00	292.53	0.62	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:30:15	2,655.00	292.54	0.61	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:35:15	2,660.00	292.52	0.63	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:40:15	2,665.00	292.52	0.63	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	4:45:15	2,670.00	292.52	0.63	0.00	90,282,900	293.12	0.03	0.00	98,911,770
08/21/1999	4:50:15	2,675.00	292.52	0.63	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	4:55:15	2,680.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:00:15	2,685.00	292.51	0.65	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:05:15	2,690.00	292.51	0.65	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:10:15	2,695.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:15:15	2,700.00	292.51	0.65	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:20:15	2,705.00	292.51	0.65	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:25:15	2,710.00	292.51	0.65	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:30:15	2,715.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:35:15	2,720.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:40:15	2,725.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:45:15	2,730.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:50:15	2,735.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	5:55:15	2,740.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:00:15	2,745.00	292.52	0.63	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:05:15	2,750.00	292.52	0.63	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:10:15	2,755.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:15:15	2,760.00	292.51	0.65	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	6:20:15	2,765.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:25:15	2,770.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:30:15	2,775.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:35:15	2,780.00	292.52	0.63	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:40:15	2,785.00	292.52	0.63	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:45:15	2,790.00	292.51	0.64	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:50:15	2,795.00	292.51	0.65	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	6:55:15	2,800.00	292.51	0.65	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	7:00:15	2,805.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:05:15	2,810.00	292.50	0.65	0.00	90,282,900	293.11	0.05	0.00	98,911,770
08/21/1999	7:10:15	2,815.00	292.50	0.65	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:15:15	2,820.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:20:15	2,825.00	292.48	0.67	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:25:15	2,830.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:30:15	2,835.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:35:15	2,840.00	292.50	0.65	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:40:15	2,845.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:45:15	2,850.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:50:15	2,855.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	7:55:15	2,860.00	292.48	0.67	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:00:15	2,865.00	292.48	0.67	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:05:15	2,870.00	292.48	0.67	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:10:15	2,875.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:15:15	2,880.00	292.48	0.67	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:20:15	2,885.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:25:15	2,890.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/21/1999	8:30:15	2,895.00	292.49	0.66	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:35:15	2,900.00	292.48	0.67	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:40:15	2,905.00	292.47	0.68	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:45:15	2,910.00	292.47	0.68	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:50:15	2,915.00	292.47	0.68	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	8:55:15	2,920.00	292.47	0.68	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	9:00:15	2,925.00	292.47	0.69	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	9:05:15	2,930.00	292.47	0.69	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	9:10:15	2,935.00	292.47	0.68	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	9:15:15	2,940.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	9:20:15	2,945.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	9:25:15	2,950.00	292.47	0.68	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	9:30:15	2,955.00	292.47	0.68	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	9:35:15	2,960.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	9:40:15	2,965.00	292.47	0.68	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	9:45:15	2,970.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	9:50:15	2,975.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	9:55:15	2,980.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:00:15	2,985.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:05:15	2,990.00	292.46	0.69	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	10:10:15	2,995.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:15:15	3,000.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:20:15	3,005.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:25:15	3,010.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:30:15	3,015.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:35:15	3,020.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:40:15	3,025.00	292.46	0.69	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	10:45:15	3,030.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:50:15	3,035.00	292.45	0.70	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	10:55:15	3,040.00	292.45	0.70	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:00:15	3,045.00	292.45	0.70	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:05:15	3,050.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:10:15	3,055.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:15:15	3,060.00	292.47	0.69	0.00	90,282,900	293.09	0.06	0.00	98,911,770
08/21/1999	11:20:15	3,065.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:25:15	3,070.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:30:15	3,075.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:35:15	3,080.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:40:15	3,085.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:45:15	3,090.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:50:15	3,095.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	11:55:15	3,100.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	12:00:15	3,105.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	12:05:15	3,110.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	12:10:15	3,115.00	292.47	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	12:15:15	3,120.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	12:20:15	3,125.00	292.45	0.70	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	12:25:15	3,130.00	292.46	0.69	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	12:30:15	3,135.00	292.45	0.70	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	12:35:15	3,140.00	292.45	0.70	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	12:40:15	3,145.00	292.45	0.70	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	12:45:15	3,150.00	292.45	0.70	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	12:50:15	3,155.00	292.44	0.71	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	12:55:15	3,160.00	292.45	0.70	0.00	90,282,900	293.07	0.08	0.00	98,911,770
08/21/1999	13:00:15	3,165.00	292.44	0.71	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:05:15	3,170.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:10:15	3,175.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:15:15	3,180.00	292.44	0.71	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:20:15	3,185.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:25:15	3,190.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:30:15	3,195.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:35:15	3,200.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:40:15	3,205.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/21/1999	13:45:15	3,210.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:50:15	3,215.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	13:55:15	3,220.00	292.44	0.71	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:00:15	3,225.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:05:15	3,230.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:10:15	3,235.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:15:15	3,240.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:20:15	3,245.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:25:15	3,250.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:30:15	3,255.00	292.42	0.73	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:35:15	3,260.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:40:15	3,265.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:45:15	3,270.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:50:15	3,275.00	292.42	0.73	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	14:55:15	3,280.00	292.42	0.73	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	15:00:15	3,285.00	292.42	0.73	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	15:05:15	3,290.00	292.43	0.72	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	15:10:15	3,295.00	292.43	0.72	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	15:15:15	3,300.00	292.42	0.73	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	15:20:15	3,305.00	292.40	0.75	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	15:25:15	3,310.00	292.41	0.74	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	15:30:15	3,315.00	292.41	0.74	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	15:35:15	3,320.00	292.41	0.74	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	15:40:15	3,325.00	292.41	0.74	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	15:45:15	3,330.00	292.40	0.75	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	15:50:15	3,335.00	292.41	0.74	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	15:55:15	3,340.00	292.40	0.75	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:00:15	3,345.00	292.40	0.76	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	16:05:15	3,350.00	292.40	0.75	0.00	90,282,900	293.06	0.09	0.00	98,911,770
08/21/1999	16:10:15	3,355.00	292.39	0.76	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:15:15	3,360.00	292.40	0.76	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:20:15	3,365.00	292.39	0.76	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:25:15	3,370.00	292.39	0.76	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:30:15	3,375.00	292.38	0.77	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:35:15	3,380.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:40:15	3,385.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:45:15	3,390.00	292.38	0.77	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:50:15	3,395.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	16:55:15	3,400.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:00:15	3,405.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:05:15	3,410.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:10:15	3,415.00	292.38	0.77	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:15:15	3,420.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:20:15	3,425.00	292.38	0.77	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:25:15	3,430.00	292.38	0.77	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:30:15	3,435.00	292.38	0.77	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:35:15	3,440.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:40:15	3,445.00	292.37	0.79	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:45:15	3,450.00	292.35	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:50:15	3,455.00	292.36	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	17:55:15	3,460.00	292.36	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:00:15	3,465.00	292.36	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:05:15	3,470.00	292.36	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:10:15	3,475.00	292.36	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:15:15	3,480.00	292.35	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:20:15	3,485.00	292.37	0.79	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:25:15	3,490.00	292.37	0.79	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:30:15	3,495.00	292.35	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:35:15	3,500.00	292.36	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:40:15	3,505.00	292.34	0.81	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:45:15	3,510.00	292.34	0.81	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:50:15	3,515.00	292.35	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	18:55:15	3,520.00	292.35	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/21/1999	19:00:15	3,525.00	292.35	0.80	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	19:05:15	3,530.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	19:10:15	3,535.00	292.36	0.80	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	19:15:15	3,540.00	292.37	0.79	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	19:20:15	3,545.00	292.38	0.77	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	19:25:15	3,550.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	19:30:15	3,555.00	292.38	0.77	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	19:35:15	3,560.00	292.38	0.77	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	19:40:15	3,565.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	19:45:15	3,570.00	292.37	0.78	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	19:50:15	3,575.00	292.37	0.79	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	19:55:15	3,580.00	292.38	0.77	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	20:00:15	3,585.00	292.37	0.79	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	20:05:15	3,590.00	292.36	0.80	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	20:10:15	3,595.00	292.37	0.79	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	20:15:15	3,600.00	292.37	0.79	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	20:20:15	3,605.00	292.37	0.79	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	20:25:15	3,610.00	292.36	0.80	0.00	90,282,900	293.04	0.11	0.00	98,911,770
08/21/1999	20:30:15	3,615.00	292.37	0.79	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	20:35:15	3,620.00	292.35	0.80	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	20:40:15	3,625.00	292.36	0.80	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	20:45:15	3,630.00	292.36	0.80	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	20:50:15	3,635.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	20:55:15	3,640.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:00:15	3,645.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:05:15	3,650.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:10:15	3,655.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:15:15	3,660.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:20:15	3,665.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:25:15	3,670.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:30:15	3,675.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:35:15	3,680.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:40:15	3,685.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:45:15	3,690.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:50:15	3,695.00	292.35	0.80	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	21:55:15	3,700.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:00:15	3,705.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:05:15	3,710.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:10:15	3,715.00	292.35	0.80	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:15:15	3,720.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:20:15	3,725.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:25:15	3,730.00	292.34	0.81	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:30:15	3,735.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:35:15	3,740.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:40:15	3,745.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:45:15	3,750.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:50:15	3,755.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	22:55:15	3,760.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:00:15	3,765.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:05:15	3,770.00	292.33	0.82	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:10:15	3,775.00	292.33	0.83	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:15:15	3,780.00	292.33	0.83	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:20:15	3,785.00	292.33	0.83	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:25:15	3,790.00	292.31	0.84	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:30:15	3,795.00	292.31	0.84	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:35:15	3,800.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:40:15	3,805.00	292.31	0.84	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:45:15	3,810.00	292.31	0.84	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:50:15	3,815.00	292.31	0.84	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/21/1999	23:55:15	3,820.00	292.31	0.84	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:00:15	3,825.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:05:15	3,830.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:10:15	3,835.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/22/1999	0:15:15	3,840.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:20:15	3,845.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:25:15	3,850.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:30:15	3,855.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:35:15	3,860.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:40:15	3,865.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:45:15	3,870.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:50:15	3,875.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	0:55:15	3,880.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:00:15	3,885.00	292.28	0.87	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:05:15	3,890.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:10:15	3,895.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:15:15	3,900.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:20:15	3,905.00	292.28	0.87	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:25:15	3,910.00	292.28	0.87	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:30:15	3,915.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:35:15	3,920.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:40:15	3,925.00	292.28	0.87	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:45:15	3,930.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:50:15	3,935.00	292.30	0.85	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	1:55:15	3,940.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	2:00:15	3,945.00	292.29	0.86	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	2:05:15	3,950.00	292.28	0.87	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	2:10:15	3,955.00	292.28	0.87	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	2:15:15	3,960.00	292.28	0.87	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	2:20:15	3,965.00	292.28	0.87	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	2:25:15	3,970.00	292.28	0.87	0.00	90,282,900	293.03	0.12	0.00	98,911,770
08/22/1999	2:30:15	3,975.00	292.28	0.87	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	2:35:15	3,980.00	292.28	0.87	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	2:40:15	3,985.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	2:45:15	3,990.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	2:50:15	3,995.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	2:55:15	4,000.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:00:15	4,005.00	292.28	0.87	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:05:15	4,010.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:10:15	4,015.00	292.28	0.87	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:15:15	4,020.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:20:15	4,025.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:25:15	4,030.00	292.28	0.87	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:30:15	4,035.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:35:15	4,040.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:40:15	4,045.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:45:15	4,050.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:50:15	4,055.00	292.27	0.88	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	3:55:15	4,060.00	292.26	0.89	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	4:00:15	4,065.00	292.26	0.89	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	4:05:15	4,070.00	292.25	0.90	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	4:10:15	4,075.00	292.25	0.90	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	4:15:15	4,080.00	292.25	0.90	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	4:20:15	4,085.00	292.26	0.89	0.00	90,282,900	293.01	0.14	0.00	98,911,770
08/22/1999	4:25:15	4,090.00	292.26	0.89	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	4:30:15	4,095.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	4:35:15	4,100.00	292.25	0.90	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	4:40:15	4,105.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	4:45:15	4,110.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	4:50:15	4,115.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	4:55:15	4,120.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:00:15	4,125.00	292.24	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:05:15	4,130.00	292.25	0.90	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:10:15	4,135.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:15:15	4,140.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:20:15	4,145.00	292.27	0.88	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:25:15	4,150.00	292.26	0.89	0.00	90,282,900	293.00	0.16	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/22/1999	5:30:15	4,155.00	292.25	0.90	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:35:15	4,160.00	292.26	0.89	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:40:15	4,165.00	292.26	0.89	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:45:15	4,170.00	292.25	0.90	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:50:15	4,175.00	292.25	0.90	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	5:55:15	4,180.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:00:15	4,185.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:05:15	4,190.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:10:15	4,195.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:15:15	4,200.00	292.25	0.90	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:20:15	4,205.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:25:15	4,210.00	292.25	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:30:15	4,215.00	292.24	0.91	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:35:15	4,220.00	292.22	0.93	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	6:40:15	4,225.00	292.22	0.93	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:45:15	4,230.00	292.23	0.92	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:50:15	4,235.00	292.22	0.93	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	6:55:15	4,240.00	292.22	0.94	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	7:00:15	4,245.00	292.22	0.94	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	7:05:15	4,250.00	292.21	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	7:10:15	4,255.00	292.21	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	7:15:15	4,260.00	292.21	0.95	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	7:20:15	4,265.00	292.21	0.95	0.00	90,282,900	293.00	0.16	0.00	98,911,770
08/22/1999	7:25:15	4,270.00	292.20	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	7:30:15	4,275.00	292.21	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	7:35:15	4,280.00	292.21	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	7:40:15	4,285.00	292.22	0.93	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	7:45:15	4,290.00	292.20	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	7:50:15	4,295.00	292.20	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	7:55:15	4,300.00	292.20	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:00:15	4,305.00	292.21	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:05:15	4,310.00	292.20	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:10:15	4,315.00	292.21	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:15:15	4,320.00	292.21	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:20:15	4,325.00	292.21	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:25:15	4,330.00	292.20	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:30:15	4,335.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:35:15	4,340.00	292.20	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:40:15	4,345.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:45:15	4,350.00	292.18	0.97	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:50:15	4,355.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	8:55:15	4,360.00	292.18	0.97	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:00:15	4,365.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:05:15	4,370.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:10:15	4,375.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:15:15	4,380.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:20:15	4,385.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:25:15	4,390.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:30:15	4,395.00	292.21	0.95	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:35:15	4,400.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:40:15	4,405.00	292.19	0.96	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:45:15	4,410.00	292.18	0.97	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:50:15	4,415.00	292.18	0.97	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	9:55:15	4,420.00	292.18	0.97	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:00:15	4,425.00	292.18	0.97	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:05:15	4,430.00	292.18	0.98	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:10:15	4,435.00	292.18	0.98	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:15:15	4,440.00	292.18	0.97	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:20:15	4,445.00	292.17	0.99	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:25:15	4,450.00	292.17	0.99	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:30:15	4,455.00	292.16	0.99	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:35:15	4,460.00	292.15	1.00	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:40:15	4,465.00	292.15	1.00	0.00	90,282,900	292.98	0.17	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/22/1999	10:45:15	4,470.00	292.17	0.99	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:50:15	4,475.00	292.15	1.00	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	10:55:15	4,480.00	292.17	0.99	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	11:00:15	4,485.00	292.14	1.01	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	11:05:15	4,490.00	292.14	1.02	0.00	90,282,900	292.98	0.17	0.00	98,911,770
08/22/1999	11:10:15	4,495.00	292.14	1.02	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	11:15:15	4,500.00	292.13	1.02	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	11:20:15	4,505.00	292.13	1.02	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	11:25:15	4,510.00	292.13	1.02	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	11:30:15	4,515.00	292.13	1.02	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	11:35:15	4,520.00	292.12	1.03	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	11:40:15	4,525.00	292.11	1.04	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	11:45:15	4,530.00	292.11	1.04	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	11:50:15	4,535.00	292.11	1.04	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	11:55:15	4,540.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:00:15	4,545.00	292.11	1.04	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:05:15	4,550.00	292.11	1.04	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:10:15	4,555.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:15:15	4,560.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:20:15	4,565.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:25:15	4,570.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:30:15	4,575.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:35:15	4,580.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:40:15	4,585.00	292.09	1.06	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:45:15	4,590.00	292.09	1.06	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:50:15	4,595.00	292.08	1.07	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	12:55:15	4,600.00	292.09	1.06	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:00:15	4,605.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:05:15	4,610.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:10:15	4,615.00	292.09	1.06	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:15:15	4,620.00	292.10	1.05	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:20:15	4,625.00	292.09	1.06	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:25:15	4,630.00	292.07	1.08	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:30:15	4,635.00	292.07	1.08	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:35:15	4,640.00	292.07	1.08	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:40:15	4,645.00	292.07	1.08	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:45:15	4,650.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:50:15	4,655.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	13:55:15	4,660.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:00:15	4,665.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:05:15	4,670.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:10:15	4,675.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:15:15	4,680.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:20:15	4,685.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:25:15	4,690.00	292.07	1.08	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:30:15	4,695.00	292.07	1.08	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:35:15	4,700.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:40:15	4,705.00	292.07	1.08	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:45:15	4,710.00	292.07	1.08	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:50:15	4,715.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	14:55:15	4,720.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:00:15	4,725.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:05:15	4,730.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:10:15	4,735.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:15:15	4,740.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:20:15	4,745.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:25:15	4,750.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:30:15	4,755.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:35:15	4,760.00	292.07	1.09	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:40:15	4,765.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:45:15	4,770.00	292.05	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:50:15	4,775.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	15:55:15	4,780.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/22/1999	16:00:15	4,785.00	292.05	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	16:05:15	4,790.00	292.06	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	16:10:15	4,795.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	16:15:15	4,800.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	16:20:15	4,805.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	16:25:15	4,810.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	16:30:15	4,815.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	16:35:15	4,820.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	16:40:15	4,825.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	16:45:15	4,830.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	16:50:15	4,835.00	292.06	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	16:55:15	4,840.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:00:15	4,845.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:05:15	4,850.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:10:15	4,855.00	292.05	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	17:15:15	4,860.00	292.06	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:20:15	4,865.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:25:15	4,870.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:30:15	4,875.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:35:15	4,880.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:40:15	4,885.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:45:15	4,890.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:50:15	4,895.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	17:55:15	4,900.00	292.06	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	18:00:15	4,905.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:05:15	4,910.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:10:15	4,915.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:15:15	4,920.00	292.05	1.10	0.00	90,282,900	292.96	0.19	0.00	98,911,770
08/22/1999	18:20:15	4,925.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:25:15	4,930.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:30:15	4,935.00	292.07	1.08	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:35:15	4,940.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:40:15	4,945.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:45:15	4,950.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:50:15	4,955.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	18:55:15	4,960.00	292.07	1.09	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	19:00:15	4,965.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	19:05:15	4,970.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	19:10:15	4,975.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	19:15:15	4,980.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	19:20:15	4,985.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	19:25:15	4,990.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	19:30:15	4,995.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	19:35:15	5,000.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	19:40:15	5,005.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	19:45:15	5,010.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	19:50:15	5,015.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	19:55:15	5,020.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	20:00:15	5,025.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	20:05:15	5,030.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	20:10:15	5,035.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	20:15:15	5,040.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	20:20:15	5,045.00	292.03	1.13	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	20:25:15	5,050.00	292.02	1.14	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	20:30:15	5,055.00	292.03	1.13	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	20:35:15	5,060.00	292.02	1.14	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	20:40:15	5,065.00	292.03	1.13	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	20:45:15	5,070.00	292.02	1.14	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	20:50:15	5,075.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	20:55:15	5,080.00	292.02	1.14	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	21:00:15	5,085.00	292.02	1.14	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	21:05:15	5,090.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	21:10:15	5,095.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/22/1999	21:15:15	5,100.00	292.02	1.14	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	21:20:15	5,105.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	21:25:15	5,110.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	21:30:15	5,115.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	21:35:15	5,120.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	21:40:15	5,125.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	21:45:15	5,130.00	292.03	1.13	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	21:50:15	5,135.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	21:55:15	5,140.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:00:15	5,145.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:05:15	5,150.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	22:10:15	5,155.00	292.03	1.13	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:15:15	5,160.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:20:15	5,165.00	292.03	1.13	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:25:15	5,170.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:30:15	5,175.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:35:15	5,180.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:40:15	5,185.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:45:15	5,190.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	22:50:15	5,195.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	22:55:15	5,200.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	23:00:15	5,205.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	23:05:15	5,210.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	23:10:15	5,215.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	23:15:15	5,220.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	23:20:15	5,225.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	23:25:15	5,230.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	23:30:15	5,235.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	23:35:15	5,240.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/22/1999	23:40:15	5,245.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	23:45:15	5,250.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	23:50:15	5,255.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/22/1999	23:55:15	5,260.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:00:15	5,265.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/23/1999	0:05:15	5,270.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:10:15	5,275.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:15:15	5,280.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:20:15	5,285.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:25:15	5,290.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:30:15	5,295.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/23/1999	0:35:15	5,300.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:40:15	5,305.00	292.06	1.10	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:45:15	5,310.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:50:15	5,315.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	0:55:15	5,320.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:00:15	5,325.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:05:15	5,330.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:10:15	5,335.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:15:15	5,340.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:20:15	5,345.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:25:15	5,350.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:30:15	5,355.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:35:15	5,360.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:40:15	5,365.00	292.04	1.11	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/23/1999	1:45:15	5,370.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	1:50:15	5,375.00	292.05	1.10	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/23/1999	1:55:15	5,380.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:00:15	5,385.00	292.03	1.12	0.00	90,282,900	292.95	0.21	0.00	98,911,770
08/23/1999	2:05:15	5,390.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:10:15	5,395.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:15:15	5,400.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:20:15	5,405.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:25:15	5,410.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/23/1999	2:30:15	5,415.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:35:15	5,420.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:40:15	5,425.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:45:15	5,430.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:50:15	5,435.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	2:55:15	5,440.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:00:15	5,445.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:05:15	5,450.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:10:15	5,455.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:15:15	5,460.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:20:15	5,465.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:25:15	5,470.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:30:15	5,475.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:35:15	5,480.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:40:15	5,485.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:45:15	5,490.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:50:15	5,495.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	3:55:15	5,500.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:00:15	5,505.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:05:15	5,510.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:10:15	5,515.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:15:15	5,520.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:20:15	5,525.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:25:15	5,530.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:30:15	5,535.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:35:15	5,540.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:40:15	5,545.00	292.05	1.10	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:45:15	5,550.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:50:15	5,555.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	4:55:15	5,560.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:00:15	5,565.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:05:15	5,570.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:10:15	5,575.00	292.04	1.11	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:15:15	5,580.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:20:15	5,585.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:25:15	5,590.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:30:15	5,595.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:35:15	5,600.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:40:15	5,605.00	292.03	1.12	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	5:45:15	5,610.00	292.03	1.13	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	5:50:15	5,615.00	292.03	1.13	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	5:55:15	5,620.00	292.03	1.12	0.00	90,282,900	292.93	0.22	0.00	98,911,770
08/23/1999	6:00:15	5,625.00	292.03	1.12	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:05:15	5,630.00	292.03	1.13	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:10:15	5,635.00	292.03	1.13	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:15:15	5,640.00	292.03	1.13	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:20:15	5,645.00	292.03	1.13	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:25:15	5,650.00	292.03	1.13	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:30:15	5,655.00	292.03	1.13	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:35:15	5,660.00	292.03	1.13	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:40:15	5,665.00	292.02	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:45:15	5,670.00	292.03	1.13	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:50:15	5,675.00	292.02	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	6:55:15	5,680.00	292.02	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:00:15	5,685.00	292.01	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:05:15	5,690.00	292.01	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:10:15	5,695.00	292.02	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:15:15	5,700.00	292.02	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:20:15	5,705.00	292.02	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:25:15	5,710.00	292.02	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:30:15	5,715.00	292.01	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:35:15	5,720.00	292.01	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:40:15	5,725.00	292.01	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/23/1999	7:45:15	5,730.00	292.01	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:50:15	5,735.00	292.00	1.15	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	7:55:15	5,740.00	292.01	1.14	0.00	90,282,900	292.92	0.24	0.00	98,911,770
08/23/1999	8:00:15	5,745.00	292.02	1.14	248.9	90,284,145	292.92	0.24	0.0	98,911,770
08/23/1999	8:05:15	5,750.00	292.02	1.14	248.9	90,285,389	292.92	0.24	0.0	98,911,770
08/23/1999	8:10:15	5,755.00	292.01	1.14	248.9	90,286,634	292.92	0.24	0.0	98,911,770
08/23/1999	8:15:15	5,760.00	292.01	1.14	248.9	90,287,879	292.92	0.24	0.0	98,911,770
08/23/1999	8:20:15	5,765.00	292.02	1.14	248.9	90,289,123	292.92	0.24	0.0	98,911,770
08/23/1999	8:25:15	5,770.00	292.01	1.14	248.9	90,290,368	292.92	0.24	0.0	98,911,770
08/23/1999	8:30:15	5,775.00	292.02	1.14	248.9	90,291,613	292.92	0.24	0.0	98,911,770
08/23/1999	8:35:15	5,780.00	292.01	1.14	248.9	90,292,857	292.92	0.24	0.0	98,911,770
08/23/1999	8:40:15	5,785.00	292.01	1.14	248.9	90,294,102	292.92	0.24	0.0	98,911,770
08/23/1999	8:45:15	5,790.00	292.01	1.14	248.9	90,295,347	292.92	0.24	0.0	98,911,770
08/23/1999	8:50:15	5,795.00	292.00	1.15	248.9	90,296,591	292.92	0.24	0.0	98,911,770
08/23/1999	8:55:15	5,800.00	292.01	1.14	248.9	90,297,836	292.92	0.24	0.0	98,911,770
08/23/1999	9:00:15	5,805.00	292.00	1.15	248.9	90,299,081	292.92	0.24	0.0	98,911,770
08/23/1999	9:05:15	5,810.00	292.00	1.15	248.9	90,300,325	292.92	0.24	0.0	98,911,770
08/23/1999	9:10:15	5,815.00	292.00	1.15	248.9	90,301,570	292.92	0.24	0.0	98,911,770
08/23/1999	9:15:15	5,820.00	292.00	1.15	248.9	90,302,815	292.92	0.24	0.0	98,911,770
08/23/1999	9:20:15	5,825.00	292.00	1.15	248.9	90,304,059	292.92	0.24	0.0	98,911,770
08/23/1999	9:25:15	5,830.00	292.01	1.14	248.9	90,305,304	292.92	0.24	0.0	98,911,770
08/23/1999	9:30:15	5,835.00	292.00	1.15	248.9	90,306,548	292.92	0.24	0.0	98,911,770
08/23/1999	9:35:15	5,840.00	292.00	1.15	248.9	90,307,793	292.92	0.24	0.0	98,911,770
08/23/1999	9:40:15	5,845.00	292.01	1.14	248.9	90,309,038	292.92	0.24	0.0	98,911,770
08/23/1999	9:45:15	5,850.00	292.00	1.15	248.9	90,310,282	292.92	0.24	0.0	98,911,770
08/23/1999	9:50:15	5,855.00	292.00	1.15	248.9	90,311,527	292.92	0.24	0.0	98,911,770
08/23/1999	9:55:15	5,860.00	292.01	1.14	248.9	90,312,772	292.92	0.24	0.0	98,911,770
08/23/1999	10:00:15	5,865.00	292.00	1.15	248.9	90,314,016	292.92	0.24	0.0	98,911,770
08/23/1999	10:05:15	5,870.00	292.00	1.15	248.9	90,315,261	292.92	0.24	0.0	98,911,770
08/23/1999	10:10:15	5,875.00	292.00	1.15	248.9	90,316,506	292.92	0.24	0.0	98,911,770
08/23/1999	10:15:15	5,880.00	292.01	1.14	248.9	90,317,750	292.92	0.24	0.0	98,911,770
08/23/1999	10:20:15	5,885.00	292.00	1.15	248.9	90,318,995	292.92	0.24	0.0	98,911,770
08/23/1999	10:25:15	5,890.00	292.00	1.15	248.9	90,320,240	292.92	0.24	0.0	98,911,770
08/23/1999	10:30:15	5,895.00	292.00	1.15	248.9	90,321,484	292.92	0.24	0.0	98,911,770
08/23/1999	10:35:15	5,900.00	291.99	1.16	248.9	90,322,729	292.92	0.24	0.0	98,911,770
08/23/1999	10:40:15	5,905.00	287.79	5.36	248.9	90,323,974	292.92	0.24	0.0	98,911,770
08/23/1999	10:45:15	5,910.00	291.87	1.28	248.9	90,325,218	292.86	0.30	0.0	98,911,770
08/23/1999	10:50:15	5,915.00	291.93	1.22	248.9	90,326,463	292.89	0.27	0.0	98,911,770
08/23/1999	10:55:15	5,920.00	291.93	1.22	248.9	90,327,708	292.89	0.27	0.0	98,911,770
08/23/1999	11:00:15	5,925.00	291.92	1.23	248.9	90,328,952	292.87	0.28	0.0	98,911,770
08/23/1999	11:05:15	5,930.00	291.92	1.24	248.9	90,330,197	292.87	0.28	0.0	98,911,770
08/23/1999	11:10:15	5,935.00	291.92	1.23	248.9	90,331,442	292.87	0.28	0.0	98,911,770
08/23/1999	11:15:15	5,940.00	291.91	1.24	248.9	90,332,686	292.86	0.30	0.0	98,911,770
08/23/1999	11:20:15	5,945.00	291.90	1.25	248.9	90,333,931	292.86	0.30	0.0	98,911,770
08/23/1999	11:25:15	5,950.00	291.88	1.27	248.9	90,335,176	292.86	0.30	0.0	98,911,770
08/23/1999	11:30:15	5,955.00	287.92	5.24	248.9	90,336,420	292.84	0.31	0.0	98,911,770
08/23/1999	11:35:15	5,960.00	291.83	1.32	248.9	90,337,665	292.82	0.33	0.0	98,911,770
08/23/1999	11:40:15	5,965.00	291.74	1.41	248.9	90,338,910	292.79	0.36	0.0	98,911,770
08/23/1999	11:45:15	5,970.00	287.32	5.83	248.9	90,340,154	292.76	0.39	0.0	98,911,770
08/23/1999	11:50:15	5,975.00	291.73	1.43	248.9	90,341,399	292.78	0.38	0.0	98,911,770
08/23/1999	11:55:15	5,980.00	291.64	1.51	248.9	90,342,644	292.76	0.39	0.0	98,911,770
08/23/1999	12:00:15	5,985.00	287.30	5.85	248.9	90,343,888	292.76	0.39	0.0	98,911,770
08/23/1999	12:05:15	5,990.00	286.99	6.16	248.9	90,345,133	292.65	0.50	0.0	98,911,770
08/23/1999	12:10:15	5,995.00	286.74	6.41	248.9	90,346,378	292.59	0.57	0.0	98,911,770
08/23/1999	12:15:15	6,000.00	286.68	6.47	248.9	90,347,622	292.56	0.60	0.0	98,911,770
08/23/1999	12:20:15	6,005.00	286.72	6.43	248.9	90,348,867	292.52	0.63	0.0	98,911,770
08/23/1999	12:25:15	6,010.00	291.29	1.87	248.9	90,350,111	292.57	0.58	0.0	98,911,770
08/23/1999	12:30:15	6,015.00	286.73	6.42	248.9	90,351,356	292.56	0.60	0.0	98,911,770
08/23/1999	12:35:15	6,020.00	286.62	6.54	248.9	90,352,601	292.49	0.66	0.0	98,911,770
08/23/1999	12:40:15	6,025.00	291.20	1.95	248.9	90,353,845	292.54	0.61	0.0	98,911,770
08/23/1999	12:45:15	6,030.00	286.67	6.48	248.9	90,355,090	292.52	0.63	0.0	98,911,770
08/23/1999	12:50:15	6,035.00	286.56	6.59	248.9	90,356,335	292.48	0.68	0.0	98,911,770
08/23/1999	12:55:15	6,040.00	286.53	6.62	248.9	90,357,579	292.43	0.72	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/23/1999	13:00:15	6,045.00	286.41	6.74	248.9	90,358,824	292.41	0.74	0.0	98,911,770
08/23/1999	13:05:15	6,050.00	286.36	6.79	248.9	90,360,069	292.40	0.75	0.0	98,911,770
08/23/1999	13:10:15	6,055.00	286.39	6.76	248.9	90,361,313	292.37	0.79	0.0	98,911,770
08/23/1999	13:15:15	6,060.00	286.24	6.91	248.9	90,362,558	292.35	0.80	0.0	98,911,770
08/23/1999	13:20:15	6,065.00	286.31	6.84	248.9	90,363,803	292.33	0.82	0.0	98,911,770
08/23/1999	13:25:15	6,070.00	286.21	6.95	248.9	90,365,047	292.32	0.84	0.0	98,911,770
08/23/1999	13:30:15	6,075.00	286.14	7.02	248.9	90,366,292	292.30	0.85	0.0	98,911,770
08/23/1999	13:35:15	6,080.00	286.15	7.00	248.9	90,367,537	292.29	0.87	0.0	98,911,770
08/23/1999	13:40:15	6,085.00	286.06	7.10	248.9	90,368,781	292.27	0.88	0.0	98,911,770
08/23/1999	13:45:15	6,090.00	286.00	7.15	248.9	90,370,026	292.26	0.90	0.0	98,911,770
08/23/1999	13:50:15	6,095.00	285.99	7.16	248.9	90,371,271	292.24	0.91	0.0	98,911,770
08/23/1999	13:55:15	6,100.00	285.98	7.17	248.9	90,372,515	292.24	0.91	0.0	98,911,770
08/23/1999	14:00:15	6,105.00	286.23	6.92	248.9	90,373,760	292.27	0.88	0.0	98,911,770
08/23/1999	14:05:15	6,110.00	286.18	6.97	248.9	90,375,005	292.26	0.90	0.0	98,911,770
08/23/1999	14:10:15	6,115.00	286.08	7.07	248.9	90,376,249	292.22	0.93	0.0	98,911,770
08/23/1999	14:15:15	6,120.00	286.00	7.15	248.9	90,377,494	292.21	0.94	0.0	98,911,770
08/23/1999	14:20:15	6,125.00	286.10	7.05	248.9	90,378,739	292.19	0.96	0.0	98,911,770
08/23/1999	14:25:15	6,130.00	286.11	7.04	248.9	90,379,983	292.18	0.98	0.0	98,911,770
08/23/1999	14:30:15	6,135.00	290.57	2.58	248.9	90,381,228	292.22	0.93	0.0	98,911,770
08/23/1999	14:35:15	6,140.00	286.18	6.97	248.9	90,382,473	292.26	0.90	0.0	98,911,770
08/23/1999	14:40:15	6,145.00	285.99	7.16	248.9	90,383,717	292.21	0.94	0.0	98,911,770
08/23/1999	14:45:15	6,150.00	285.99	7.16	248.9	90,384,962	292.18	0.98	0.0	98,911,770
08/23/1999	14:50:15	6,155.00	285.94	7.21	248.9	90,386,207	292.15	1.01	0.0	98,911,770
08/23/1999	14:55:15	6,160.00	285.92	7.23	248.9	90,387,451	292.15	1.01	0.0	98,911,770
08/23/1999	15:00:15	6,165.00	285.98	7.17	248.9	90,388,696	292.13	1.02	0.0	98,911,770
08/23/1999	15:05:15	6,170.00	285.83	7.32	248.9	90,389,941	292.12	1.04	0.0	98,911,770
08/23/1999	15:10:15	6,175.00	285.80	7.35	248.9	90,391,185	292.10	1.05	0.0	98,911,770
08/23/1999	15:15:15	6,180.00	285.90	7.25	248.9	90,392,430	292.08	1.07	0.0	98,911,770
08/23/1999	15:20:15	6,185.00	285.84	7.32	248.9	90,393,675	292.08	1.07	0.0	98,911,770
08/23/1999	15:25:15	6,190.00	285.68	7.47	248.9	90,394,919	292.07	1.09	0.0	98,911,770
08/23/1999	15:30:15	6,195.00	285.74	7.41	248.9	90,396,164	292.05	1.10	0.0	98,911,770
08/23/1999	15:35:15	6,200.00	285.62	7.54	248.9	90,397,408	292.05	1.10	0.0	98,911,770
08/23/1999	15:40:15	6,205.00	285.73	7.43	248.9	90,398,653	292.05	1.10	0.0	98,911,770
08/23/1999	15:45:15	6,210.00	285.69	7.47	248.9	90,399,898	292.02	1.13	0.0	98,911,770
08/23/1999	15:50:15	6,215.00	285.57	7.58	248.9	90,401,142	292.02	1.13	0.0	98,911,770
08/23/1999	15:55:15	6,220.00	285.62	7.53	248.9	90,402,387	292.00	1.15	0.0	98,911,770
08/23/1999	16:00:15	6,225.00	285.59	7.56	248.9	90,403,632	292.00	1.15	0.0	98,911,770
08/23/1999	16:05:15	6,230.00	285.69	7.47	248.9	90,404,876	291.99	1.17	0.0	98,911,770
08/23/1999	16:10:15	6,235.00	285.65	7.50	248.9	90,406,121	291.99	1.17	0.0	98,911,770
08/23/1999	16:15:15	6,240.00	285.61	7.54	248.9	90,407,366	291.97	1.18	0.0	98,911,770
08/23/1999	16:20:15	6,245.00	285.64	7.51	248.9	90,408,610	291.96	1.20	0.0	98,911,770
08/23/1999	16:25:15	6,250.00	285.62	7.53	248.9	90,409,855	291.96	1.20	0.0	98,911,770
08/23/1999	16:30:15	6,255.00	285.53	7.62	248.9	90,411,100	291.94	1.21	0.0	98,911,770
08/23/1999	16:35:15	6,260.00	285.53	7.62	248.9	90,412,344	291.94	1.21	0.0	98,911,770
08/23/1999	16:40:15	6,265.00	285.56	7.59	248.9	90,413,589	291.93	1.23	0.0	98,911,770
08/23/1999	16:45:15	6,270.00	285.55	7.60	248.9	90,414,834	291.91	1.24	0.0	98,911,770
08/23/1999	16:50:15	6,275.00	285.60	7.55	248.9	90,416,078	291.93	1.23	0.0	98,911,770
08/23/1999	16:55:15	6,280.00	285.57	7.58	248.9	90,417,323	291.91	1.24	0.0	98,911,770
08/23/1999	17:00:15	6,285.00	285.63	7.52	248.9	90,418,568	291.91	1.24	0.0	98,911,770
08/23/1999	17:05:15	6,290.00	285.45	7.70	248.9	90,419,812	291.89	1.26	0.0	98,911,770
08/23/1999	17:10:15	6,295.00	285.43	7.73	248.9	90,421,057	291.88	1.28	0.0	98,911,770
08/23/1999	17:15:15	6,300.00	285.48	7.67	248.9	90,422,302	291.88	1.28	0.0	98,911,770
08/23/1999	17:20:15	6,305.00	285.40	7.76	248.9	90,423,546	291.86	1.29	0.0	98,911,770
08/23/1999	17:25:15	6,310.00	285.32	7.83	248.9	90,424,791	291.86	1.29	0.0	98,911,770
08/23/1999	17:30:15	6,315.00	285.36	7.79	248.9	90,426,036	291.85	1.31	0.0	98,911,770
08/23/1999	17:35:15	6,320.00	285.47	7.68	248.9	90,427,280	291.85	1.31	0.0	98,911,770
08/23/1999	17:40:15	6,325.00	285.32	7.83	248.9	90,428,525	291.83	1.32	0.0	98,911,770
08/23/1999	17:45:15	6,330.00	285.40	7.76	248.9	90,429,770	291.83	1.32	0.0	98,911,770
08/23/1999	17:50:15	6,335.00	285.35	7.80	248.9	90,431,014	291.82	1.34	0.0	98,911,770
08/23/1999	17:55:15	6,340.00	285.32	7.83	248.9	90,432,259	291.82	1.34	0.0	98,911,770
08/23/1999	18:00:15	6,345.00	285.37	7.78	248.9	90,433,504	291.82	1.34	0.0	98,911,770
08/23/1999	18:05:15	6,350.00	285.31	7.84	248.9	90,434,748	291.80	1.35	0.0	98,911,770
08/23/1999	18:10:15	6,355.00	285.32	7.83	248.9	90,435,993	291.78	1.37	0.0	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/23/1999	18:15:15	6,360.00	285.38	7.77	248.9	90,437,238	291.80	1.35	0.0	98,911,770
08/23/1999	18:20:15	6,365.00	285.33	7.82	248.9	90,438,482	291.77	1.39	0.0	98,911,770
08/23/1999	18:25:15	6,370.00	285.24	7.91	248.9	90,439,727	291.77	1.39	0.0	98,911,770
08/23/1999	18:30:15	6,375.00	285.23	7.92	248.9	90,440,971	291.77	1.39	0.0	98,911,770
08/23/1999	18:35:15	6,380.00	285.19	7.96	248.9	90,442,216	291.77	1.39	0.0	98,911,770
08/23/1999	18:40:15	6,385.00	285.12	8.03	248.9	90,443,461	291.75	1.40	0.0	98,911,770
08/23/1999	18:45:15	6,390.00	285.23	7.92	248.9	90,444,705	291.74	1.42	0.0	98,911,770
08/23/1999	18:50:15	6,395.00	285.21	7.94	248.9	90,445,950	291.74	1.42	0.0	98,911,770
08/23/1999	18:55:15	6,400.00	285.21	7.95	248.9	90,447,195	291.74	1.42	0.0	98,911,770
08/23/1999	19:00:15	6,405.00	285.25	7.91	248.9	90,448,439	291.72	1.43	0.0	98,911,770
08/23/1999	19:05:15	6,410.00	285.21	7.94	248.9	90,449,684	291.72	1.43	0.0	98,911,770
08/23/1999	19:10:15	6,415.00	285.18	7.97	248.9	90,450,929	291.70	1.45	0.0	98,911,770
08/23/1999	19:15:15	6,420.00	285.15	8.00	248.9	90,452,173	291.70	1.45	0.0	98,911,770
08/23/1999	19:20:15	6,425.00	285.07	8.08	248.9	90,453,418	291.69	1.46	0.0	98,911,770
08/23/1999	19:25:15	6,430.00	285.11	8.04	248.9	90,454,663	291.69	1.46	0.0	98,911,770
08/23/1999	19:30:15	6,435.00	285.10	8.05	248.9	90,455,907	291.67	1.48	0.0	98,911,770
08/23/1999	19:35:15	6,440.00	285.21	7.94	248.9	90,457,152	291.67	1.48	0.0	98,911,770
08/23/1999	19:40:15	6,445.00	285.19	7.96	248.9	90,458,397	291.66	1.49	0.0	98,911,770
08/23/1999	19:45:15	6,450.00	285.13	8.02	248.9	90,459,641	291.66	1.49	0.0	98,911,770
08/23/1999	19:50:15	6,455.00	285.14	8.01	248.9	90,460,886	291.64	1.51	0.0	98,911,770
08/23/1999	19:55:15	6,460.00	285.20	7.95	248.9	90,462,131	291.64	1.51	0.0	98,911,770
08/23/1999	20:00:15	6,465.00	285.21	7.94	248.9	90,463,375	291.64	1.51	0.0	98,911,770
08/23/1999	20:05:15	6,470.00	284.99	8.17	248.9	90,464,620	291.63	1.53	0.0	98,911,770
08/23/1999	20:10:15	6,475.00	285.10	8.06	248.9	90,465,865	291.63	1.53	0.0	98,911,770
08/23/1999	20:15:15	6,480.00	285.09	8.06	248.9	90,467,109	291.61	1.54	0.0	98,911,770
08/23/1999	20:20:15	6,485.00	285.12	8.03	248.9	90,468,354	291.61	1.54	0.0	98,911,770
08/23/1999	20:25:15	6,490.00	285.06	8.10	248.9	90,469,599	291.59	1.56	0.0	98,911,770
08/23/1999	20:30:15	6,495.00	285.02	8.13	248.9	90,470,843	291.59	1.56	0.0	98,911,770
08/23/1999	20:35:15	6,500.00	285.02	8.13	248.9	90,472,088	291.58	1.57	0.0	98,911,770
08/23/1999	20:40:15	6,505.00	285.02	8.13	248.9	90,473,333	291.58	1.57	0.0	98,911,770
08/23/1999	20:45:15	6,510.00	285.00	8.15	248.9	90,474,577	291.58	1.57	0.0	98,911,770
08/23/1999	20:50:15	6,515.00	285.00	8.15	248.9	90,475,822	291.56	1.59	0.0	98,911,770
08/23/1999	20:55:15	6,520.00	284.96	8.19	248.9	90,477,067	291.56	1.59	0.0	98,911,770
08/23/1999	21:00:15	6,525.00	284.98	8.17	248.9	90,478,311	291.56	1.59	0.0	98,911,770
08/23/1999	21:05:15	6,530.00	285.03	8.12	248.9	90,479,556	291.55	1.61	0.0	98,911,770
08/23/1999	21:10:15	6,535.00	285.00	8.15	248.9	90,480,801	291.55	1.61	0.0	98,911,770
08/23/1999	21:15:15	6,540.00	284.96	8.19	248.9	90,482,045	291.53	1.62	0.0	98,911,770
08/23/1999	21:20:15	6,545.00	284.95	8.21	248.9	90,483,290	291.53	1.62	0.0	98,911,770
08/23/1999	21:25:15	6,550.00	284.94	8.21	248.9	90,484,534	291.53	1.62	0.0	98,911,770
08/23/1999	21:30:15	6,555.00	284.87	8.28	248.9	90,485,779	291.52	1.64	0.0	98,911,770
08/23/1999	21:35:15	6,560.00	285.01	8.14	248.9	90,487,024	291.52	1.64	0.0	98,911,770
08/23/1999	21:40:15	6,565.00	284.93	8.22	248.9	90,488,268	291.50	1.65	0.0	98,911,770
08/23/1999	21:45:15	6,570.00	284.99	8.16	248.9	90,489,513	291.50	1.65	0.0	98,911,770
08/23/1999	21:50:15	6,575.00	284.90	8.25	248.9	90,490,758	291.50	1.65	0.0	98,911,770
08/23/1999	21:55:15	6,580.00	284.87	8.28	248.9	90,492,002	291.49	1.67	0.0	98,911,770
08/23/1999	22:00:15	6,585.00	284.92	8.23	248.9	90,493,247	291.49	1.67	0.0	98,911,770
08/23/1999	22:05:15	6,590.00	284.88	8.27	248.9	90,494,492	291.49	1.67	0.0	98,911,770
08/23/1999	22:10:15	6,595.00	284.93	8.22	248.9	90,495,736	291.47	1.68	0.0	98,911,770
08/23/1999	22:15:15	6,600.00	284.92	8.23	248.9	90,496,981	291.47	1.68	0.0	98,911,770
08/23/1999	22:20:15	6,605.00	284.77	8.39	248.9	90,498,226	291.47	1.68	0.0	98,911,770
08/23/1999	22:25:15	6,610.00	284.82	8.33	248.9	90,499,470	291.45	1.70	0.0	98,911,770
08/23/1999	22:30:15	6,615.00	284.77	8.39	248.9	90,500,715	291.45	1.70	0.0	98,911,770
08/23/1999	22:35:15	6,620.00	284.79	8.36	248.9	90,501,960	291.44	1.72	0.0	98,911,770
08/23/1999	22:40:15	6,625.00	284.81	8.35	248.9	90,503,204	291.44	1.72	0.0	98,911,770
08/23/1999	22:45:15	6,630.00	284.87	8.28	248.9	90,504,449	291.44	1.72	0.0	98,911,770
08/23/1999	22:50:15	6,635.00	284.75	8.40	248.9	90,505,694	291.44	1.72	0.0	98,911,770
08/23/1999	22:55:15	6,640.00	284.81	8.35	248.9	90,506,938	291.42	1.73	0.0	98,911,770
08/23/1999	23:00:15	6,645.00	284.88	8.27	248.9	90,508,183	291.42	1.73	0.0	98,911,770
08/23/1999	23:05:15	6,650.00	284.84	8.31	248.9	90,509,428	291.40	1.75	0.0	98,911,770
08/23/1999	23:10:15	6,655.00	284.81	8.35	248.9	90,510,672	291.40	1.75	0.0	98,911,770
08/23/1999	23:15:15	6,660.00	284.87	8.28	248.9	90,511,917	291.40	1.75	0.0	98,911,770
08/23/1999	23:20:15	6,665.00	284.79	8.36	248.9	90,513,162	291.39	1.76	0.0	98,911,770
08/23/1999	23:25:15	6,670.00	284.74	8.41	248.9	90,514,406	291.39	1.76	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/23/1999	23:30:15	6,675.00	284.80	8.36	248.9	90,515,651	291.37	1.78	0.0	98,911,770
08/23/1999	23:35:15	6,680.00	284.73	8.43	248.9	90,516,896	291.37	1.78	0.0	98,911,770
08/23/1999	23:40:15	6,685.00	284.62	8.53	248.9	90,518,140	291.37	1.78	0.0	98,911,770
08/23/1999	23:45:15	6,690.00	284.67	8.48	248.9	90,519,385	291.36	1.79	0.0	98,911,770
08/23/1999	23:50:15	6,695.00	284.77	8.39	248.9	90,520,630	291.36	1.79	0.0	98,911,770
08/23/1999	23:55:15	6,700.00	284.68	8.47	248.9	90,521,874	291.36	1.79	0.0	98,911,770
08/24/1999	0:00:15	6,705.00	284.73	8.43	248.9	90,523,119	291.36	1.79	0.0	98,911,770
08/24/1999	0:05:15	6,710.00	284.73	8.43	248.9	90,524,364	291.34	1.81	0.0	98,911,770
08/24/1999	0:10:15	6,715.00	284.73	8.42	248.9	90,525,608	291.34	1.81	0.0	98,911,770
08/24/1999	0:15:15	6,720.00	284.71	8.44	248.9	90,526,853	291.33	1.83	0.0	98,911,770
08/24/1999	0:20:15	6,725.00	284.66	8.50	248.9	90,528,097	291.33	1.83	0.0	98,911,770
08/24/1999	0:25:15	6,730.00	284.81	8.34	248.9	90,529,342	291.33	1.83	0.0	98,911,770
08/24/1999	0:30:15	6,735.00	284.76	8.40	248.9	90,530,587	291.31	1.84	0.0	98,911,770
08/24/1999	0:35:15	6,740.00	284.69	8.46	248.9	90,531,831	291.31	1.84	0.0	98,911,770
08/24/1999	0:40:15	6,745.00	284.62	8.53	248.9	90,533,076	291.31	1.84	0.0	98,911,770
08/24/1999	0:45:15	6,750.00	284.66	8.50	248.9	90,534,321	291.30	1.86	0.0	98,911,770
08/24/1999	0:50:15	6,755.00	284.73	8.42	248.9	90,535,565	291.30	1.86	0.0	98,911,770
08/24/1999	0:55:15	6,760.00	284.68	8.47	248.9	90,536,810	291.30	1.86	0.0	98,911,770
08/24/1999	1:00:15	6,765.00	284.76	8.40	248.9	90,538,055	291.28	1.87	0.0	98,911,770
08/24/1999	1:05:15	6,770.00	284.58	8.57	248.9	90,539,299	291.28	1.87	0.0	98,911,770
08/24/1999	1:10:15	6,775.00	284.57	8.58	248.9	90,540,544	291.28	1.87	0.0	98,911,770
08/24/1999	1:15:15	6,780.00	284.69	8.46	248.9	90,541,789	291.26	1.89	0.0	98,911,770
08/24/1999	1:20:15	6,785.00	284.53	8.62	248.9	90,543,033	291.26	1.89	0.0	98,911,770
08/24/1999	1:25:15	6,790.00	284.62	8.53	248.9	90,544,278	291.26	1.89	0.0	98,911,770
08/24/1999	1:30:15	6,795.00	284.49	8.66	248.9	90,545,523	291.25	1.91	0.0	98,911,770
08/24/1999	1:35:15	6,800.00	284.64	8.51	248.9	90,546,767	291.25	1.91	0.0	98,911,770
08/24/1999	1:40:15	6,805.00	284.66	8.49	248.9	90,548,012	291.23	1.92	0.0	98,911,770
08/24/1999	1:45:15	6,810.00	284.68	8.47	248.9	90,549,257	291.23	1.92	0.0	98,911,770
08/24/1999	1:50:15	6,815.00	284.67	8.48	248.9	90,550,501	291.23	1.92	0.0	98,911,770
08/24/1999	1:55:15	6,820.00	284.55	8.60	248.9	90,551,746	291.23	1.92	0.0	98,911,770
08/24/1999	2:00:15	6,825.00	284.51	8.64	248.9	90,552,991	291.22	1.94	0.0	98,911,770
08/24/1999	2:05:15	6,830.00	284.61	8.55	248.9	90,554,235	291.22	1.94	0.0	98,911,770
08/24/1999	2:10:15	6,835.00	284.58	8.58	248.9	90,555,480	291.22	1.94	0.0	98,911,770
08/24/1999	2:15:15	6,840.00	284.58	8.58	248.9	90,556,725	291.20	1.95	0.0	98,911,770
08/24/1999	2:20:15	6,845.00	284.54	8.61	248.9	90,557,969	291.20	1.95	0.0	98,911,770
08/24/1999	2:25:15	6,850.00	284.54	8.61	248.9	90,559,214	291.20	1.95	0.0	98,911,770
08/24/1999	2:30:15	6,855.00	284.45	8.70	248.9	90,560,459	291.20	1.95	0.0	98,911,770
08/24/1999	2:35:15	6,860.00	284.51	8.65	248.9	90,561,703	291.19	1.97	0.0	98,911,770
08/24/1999	2:40:15	6,865.00	284.55	8.60	248.9	90,562,948	291.19	1.97	0.0	98,911,770
08/24/1999	2:45:15	6,870.00	284.42	8.73	248.9	90,564,193	291.19	1.97	0.0	98,911,770
08/24/1999	2:50:15	6,875.00	284.58	8.58	248.9	90,565,437	291.17	1.98	0.0	98,911,770
08/24/1999	2:55:15	6,880.00	284.47	8.68	248.9	90,566,682	291.17	1.98	0.0	98,911,770
08/24/1999	3:00:15	6,885.00	284.62	8.54	248.9	90,567,927	291.15	2.00	0.0	98,911,770
08/24/1999	3:05:15	6,890.00	284.53	8.62	248.9	90,569,171	291.17	1.98	0.0	98,911,770
08/24/1999	3:10:15	6,895.00	284.47	8.69	248.9	90,570,416	291.14	2.02	0.0	98,911,770
08/24/1999	3:15:15	6,900.00	284.44	8.71	248.9	90,571,661	291.15	2.00	0.0	98,911,770
08/24/1999	3:20:15	6,905.00	284.45	8.70	248.9	90,572,905	291.14	2.02	0.0	98,911,770
08/24/1999	3:25:15	6,910.00	284.40	8.75	248.9	90,574,150	291.14	2.02	0.0	98,911,770
08/24/1999	3:30:15	6,915.00	284.45	8.70	248.9	90,575,394	291.14	2.02	0.0	98,911,770
08/24/1999	3:35:15	6,920.00	284.38	8.77	248.9	90,576,639	291.14	2.02	0.0	98,911,770
08/24/1999	3:40:15	6,925.00	284.42	8.73	248.9	90,577,884	291.12	2.03	0.0	98,911,770
08/24/1999	3:45:15	6,930.00	284.45	8.70	248.9	90,579,128	291.12	2.03	0.0	98,911,770
08/24/1999	3:50:15	6,935.00	284.50	8.65	248.9	90,580,373	291.12	2.03	0.0	98,911,770
08/24/1999	3:55:15	6,940.00	284.46	8.69	248.9	90,581,618	291.11	2.05	0.0	98,911,770
08/24/1999	4:00:15	6,945.00	284.36	8.80	248.9	90,582,862	291.11	2.05	0.0	98,911,770
08/24/1999	4:05:15	6,950.00	284.42	8.73	248.9	90,584,107	291.11	2.05	0.0	98,911,770
08/24/1999	4:10:15	6,955.00	284.39	8.76	248.9	90,585,352	291.09	2.06	0.0	98,911,770
08/24/1999	4:15:15	6,960.00	284.48	8.67	248.9	90,586,596	291.09	2.06	0.0	98,911,770
08/24/1999	4:20:15	6,965.00	284.41	8.74	248.9	90,587,841	291.07	2.08	0.0	98,911,770
08/24/1999	4:25:15	6,970.00	284.34	8.81	248.9	90,589,086	291.09	2.06	0.0	98,911,770
08/24/1999	4:30:15	6,975.00	284.36	8.79	248.9	90,590,330	291.07	2.08	0.0	98,911,770
08/24/1999	4:35:15	6,980.00	284.36	8.80	248.9	90,591,575	291.07	2.08	0.0	98,911,770
08/24/1999	4:40:15	6,985.00	284.48	8.67	248.9	90,592,820	291.07	2.08	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/24/1999	4:45:15	6,990.00	284.33	8.83	248.9	90,594,064	291.06	2.09	0.0	98,911,770
08/24/1999	4:50:15	6,995.00	284.44	8.71	248.9	90,595,309	291.06	2.09	0.0	98,911,770
08/24/1999	4:55:15	7,000.00	284.36	8.79	248.9	90,596,554	291.06	2.09	0.0	98,911,770
08/24/1999	5:00:15	7,005.00	284.42	8.73	248.9	90,597,798	291.06	2.09	0.0	98,911,770
08/24/1999	5:05:15	7,010.00	284.36	8.79	248.9	90,599,043	291.04	2.11	0.0	98,911,770
08/24/1999	5:10:15	7,015.00	284.32	8.84	248.9	90,600,288	291.04	2.11	0.0	98,911,770
08/24/1999	5:15:15	7,020.00	284.36	8.79	248.9	90,601,532	291.04	2.11	0.0	98,911,770
08/24/1999	5:20:15	7,025.00	284.21	8.94	248.9	90,602,777	291.03	2.12	0.0	98,911,770
08/24/1999	5:25:15	7,030.00	284.27	8.88	248.9	90,604,022	291.03	2.12	0.0	98,911,770
08/24/1999	5:30:15	7,035.00	284.27	8.88	248.9	90,605,266	291.01	2.14	0.0	98,911,770
08/24/1999	5:35:15	7,040.00	284.36	8.80	248.9	90,606,511	291.03	2.12	0.0	98,911,770
08/24/1999	5:40:15	7,045.00	284.33	8.83	248.9	90,607,756	291.01	2.14	0.0	98,911,770
08/24/1999	5:45:15	7,050.00	284.20	8.95	248.9	90,609,000	291.01	2.14	0.0	98,911,770
08/24/1999	5:50:15	7,055.00	284.33	8.82	248.9	90,610,245	291.00	2.16	0.0	98,911,770
08/24/1999	5:55:15	7,060.00	284.25	8.90	248.9	90,611,490	291.00	2.16	0.0	98,911,770
08/24/1999	6:00:15	7,065.00	284.25	8.90	248.9	90,612,734	291.00	2.16	0.0	98,911,770
08/24/1999	6:05:15	7,070.00	284.33	8.82	248.9	90,613,979	291.00	2.16	0.0	98,911,770
08/24/1999	6:10:15	7,075.00	284.24	8.91	248.9	90,615,224	291.00	2.16	0.0	98,911,770
08/24/1999	6:15:15	7,080.00	284.34	8.81	248.9	90,616,468	290.98	2.17	0.0	98,911,770
08/24/1999	6:20:15	7,085.00	284.38	8.77	248.9	90,617,713	290.98	2.17	0.0	98,911,770
08/24/1999	6:25:15	7,090.00	284.43	8.73	248.9	90,618,957	290.98	2.17	0.0	98,911,770
08/24/1999	6:30:15	7,095.00	284.12	9.03	248.9	90,620,202	290.96	2.19	0.0	98,911,770
08/24/1999	6:35:15	7,100.00	284.14	9.02	248.9	90,621,447	290.96	2.19	0.0	98,911,770
08/24/1999	6:40:15	7,105.00	284.31	8.84	248.9	90,622,691	290.95	2.21	0.0	98,911,770
08/24/1999	6:45:15	7,110.00	284.23	8.92	248.9	90,623,936	290.95	2.21	0.0	98,911,770
08/24/1999	6:50:15	7,115.00	284.23	8.92	248.9	90,625,181	290.95	2.21	0.0	98,911,770
08/24/1999	6:55:15	7,120.00	284.09	9.06	248.9	90,626,425	290.95	2.21	0.0	98,911,770
08/24/1999	7:00:15	7,125.00	284.16	8.99	248.9	90,627,670	290.95	2.21	0.0	98,911,770
08/24/1999	7:05:15	7,130.00	284.22	8.93	248.9	90,628,915	290.95	2.21	0.0	98,911,770
08/24/1999	7:10:15	7,135.00	284.21	8.94	248.9	90,630,159	290.93	2.22	0.0	98,911,770
08/24/1999	7:15:15	7,140.00	284.04	9.11	248.9	90,631,404	290.93	2.22	0.0	98,911,770
08/24/1999	7:20:15	7,145.00	284.17	8.99	248.9	90,632,649	290.92	2.24	0.0	98,911,770
08/24/1999	7:25:15	7,150.00	284.16	8.99	248.9	90,633,893	290.92	2.24	0.0	98,911,770
08/24/1999	7:30:15	7,155.00	284.02	9.14	248.9	90,635,138	290.92	2.24	0.0	98,911,770
08/24/1999	7:35:15	7,160.00	284.18	8.97	248.9	90,636,383	290.92	2.24	0.0	98,911,770
08/24/1999	7:40:15	7,165.00	284.18	8.98	248.9	90,637,627	290.90	2.25	0.0	98,911,770
08/24/1999	7:45:15	7,170.00	284.14	9.01	248.9	90,638,872	290.90	2.25	0.0	98,911,770
08/24/1999	7:50:15	7,175.00	284.25	8.90	248.9	90,640,117	290.90	2.25	0.0	98,911,770
08/24/1999	7:55:15	7,180.00	284.15	9.00	248.9	90,641,361	290.90	2.25	0.0	98,911,770
08/24/1999	8:00:15	7,185.00	284.13	9.02	248.9	90,642,606	290.90	2.25	0.0	98,911,770
08/24/1999	8:05:15	7,190.00	283.88	9.27	248.9	90,643,851	290.89	2.27	0.0	98,911,770
08/24/1999	8:10:15	7,195.00	283.96	9.19	248.9	90,645,095	290.87	2.28	0.0	98,911,770
08/24/1999	8:15:15	7,200.00	284.01	9.14	248.9	90,646,340	290.87	2.28	0.0	98,911,770
08/24/1999	8:20:15	7,205.00	283.85	9.30	248.9	90,647,585	290.87	2.28	0.0	98,911,770
08/24/1999	8:25:15	7,210.00	284.05	9.10	248.9	90,648,829	290.87	2.28	0.0	98,911,770
08/24/1999	8:30:15	7,215.00	283.86	9.29	248.9	90,650,074	290.86	2.30	0.0	98,911,770
08/24/1999	8:35:15	7,220.00	283.91	9.24	248.9	90,651,319	290.86	2.30	0.0	98,911,770
08/24/1999	8:40:15	7,225.00	283.70	9.45	248.9	90,652,563	290.86	2.30	0.0	98,911,770
08/24/1999	8:45:15	7,230.00	283.78	9.37	248.9	90,653,808	290.84	2.31	0.0	98,911,770
08/24/1999	8:50:15	7,235.00	283.63	9.52	248.9	90,655,053	290.84	2.31	0.0	98,911,770
08/24/1999	8:55:15	7,240.00	283.73	9.42	248.9	90,656,297	290.82	2.33	0.0	98,911,770
08/24/1999	9:00:15	7,245.00	283.73	9.43	298.6	90,657,790	290.84	2.31	0.0	98,911,770
08/24/1999	9:05:15	7,250.00	283.69	9.46	298.6	90,659,284	290.82	2.33	0.0	98,911,770
08/24/1999	9:10:15	7,255.00	283.82	9.33	298.6	90,660,777	290.82	2.33	0.0	98,911,770
08/24/1999	9:15:15	7,260.00	283.77	9.38	298.6	90,662,270	290.81	2.35	0.0	98,911,770
08/24/1999	9:20:15	7,265.00	283.81	9.34	298.6	90,663,763	290.82	2.33	0.0	98,911,770
08/24/1999	9:25:15	7,270.00	283.80	9.35	298.6	90,665,257	290.81	2.35	0.0	98,911,770
08/24/1999	9:30:15	7,275.00	283.82	9.33	298.6	90,666,750	290.81	2.35	0.0	98,911,770
08/24/1999	9:35:15	7,280.00	283.79	9.36	298.6	90,668,243	290.81	2.35	0.0	98,911,770
08/24/1999	9:40:15	7,285.00	283.88	9.28	298.6	90,669,736	290.79	2.36	0.0	98,911,770
08/24/1999	9:45:15	7,290.00	283.72	9.43	298.6	90,671,230	290.79	2.36	0.0	98,911,770
08/24/1999	9:50:15	7,295.00	283.76	9.39	298.6	90,672,723	290.79	2.36	0.0	98,911,770
08/24/1999	9:55:15	7,300.00	283.95	9.20	298.6	90,674,216	290.79	2.36	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/24/1999	10:00:15	7,305.00	283.76	9.39	298.6	90,675,709	290.77	2.38	0.0	98,911,770
08/24/1999	10:05:15	7,310.00	283.78	9.37	298.6	90,677,203	290.77	2.38	0.0	98,911,770
08/24/1999	10:10:15	7,315.00	283.69	9.46	298.6	90,678,696	290.76	2.39	0.0	98,911,770
08/24/1999	10:15:15	7,320.00	283.78	9.37	298.6	90,680,189	290.76	2.39	0.0	98,911,770
08/24/1999	10:20:15	7,325.00	283.52	9.63	298.6	90,681,682	290.76	2.39	0.0	98,911,770
08/24/1999	10:25:15	7,330.00	283.73	9.42	298.6	90,683,176	290.76	2.39	0.0	98,911,770
08/24/1999	10:30:15	7,335.00	283.80	9.35	298.6	90,684,669	290.76	2.39	0.0	98,911,770
08/24/1999	10:35:15	7,340.00	283.64	9.51	298.6	90,686,162	290.74	2.41	0.0	98,911,770
08/24/1999	10:40:15	7,345.00	283.67	9.48	298.6	90,687,655	290.74	2.41	0.0	98,911,770
08/24/1999	10:45:15	7,350.00	283.70	9.45	298.6	90,689,148	290.74	2.41	0.0	98,911,770
08/24/1999	10:50:15	7,355.00	283.73	9.42	298.6	90,690,642	290.74	2.41	0.0	98,911,770
08/24/1999	10:55:15	7,360.00	283.83	9.32	298.6	90,692,135	290.74	2.41	0.0	98,911,770
08/24/1999	11:00:15	7,365.00	283.58	9.57	298.6	90,693,628	290.73	2.42	0.0	98,911,770
08/24/1999	11:05:15	7,370.00	283.65	9.50	298.6	90,695,121	290.73	2.42	0.0	98,911,770
08/24/1999	11:10:15	7,375.00	283.91	9.24	298.6	90,696,615	290.73	2.42	0.0	98,911,770
08/24/1999	11:15:15	7,380.00	283.84	9.32	298.6	90,698,108	290.73	2.42	0.0	98,911,770
08/24/1999	11:20:15	7,385.00	283.74	9.41	298.6	90,699,601	290.71	2.44	0.0	98,911,770
08/24/1999	11:25:15	7,390.00	283.55	9.61	298.6	90,701,094	290.70	2.46	0.0	98,911,770
08/24/1999	11:30:15	7,395.00	283.63	9.52	298.6	90,702,588	290.70	2.46	0.0	98,911,770
08/24/1999	11:35:15	7,400.00	283.52	9.63	298.6	90,704,081	290.71	2.44	0.0	98,911,770
08/24/1999	11:40:15	7,405.00	283.48	9.67	298.6	90,705,574	290.70	2.46	0.0	98,911,770
08/24/1999	11:45:15	7,410.00	283.65	9.50	298.6	90,707,067	290.70	2.46	0.0	98,911,770
08/24/1999	11:50:15	7,415.00	283.81	9.34	298.6	90,708,561	290.70	2.46	0.0	98,911,770
08/24/1999	11:55:15	7,420.00	283.82	9.33	298.6	90,710,054	290.68	2.47	0.0	98,911,770
08/24/1999	12:00:15	7,425.00	283.72	9.43	298.6	90,711,547	290.68	2.47	0.0	98,911,770
08/24/1999	12:05:15	7,430.00	283.51	9.64	298.6	90,713,040	290.68	2.47	0.0	98,911,770
08/24/1999	12:10:15	7,435.00	283.43	9.73	298.6	90,714,534	290.68	2.47	0.0	98,911,770
08/24/1999	12:15:15	7,440.00	283.56	9.59	298.6	90,716,027	290.67	2.49	0.0	98,911,770
08/24/1999	12:20:15	7,445.00	283.59	9.56	298.6	90,717,520	290.67	2.49	0.0	98,911,770
08/24/1999	12:25:15	7,450.00	283.40	9.75	298.6	90,719,013	290.67	2.49	0.0	98,911,770
08/24/1999	12:30:15	7,455.00	283.72	9.43	298.6	90,720,506	290.67	2.49	0.0	98,911,770
08/24/1999	12:35:15	7,460.00	283.74	9.41	298.6	90,722,000	290.65	2.50	0.0	98,911,770
08/24/1999	12:40:15	7,465.00	283.45	9.70	298.6	90,723,493	290.65	2.50	0.0	98,911,770
08/24/1999	12:45:15	7,470.00	283.49	9.66	298.6	90,724,986	290.65	2.50	0.0	98,911,770
08/24/1999	12:50:15	7,475.00	283.65	9.50	298.6	90,726,479	290.65	2.50	0.0	98,911,770
08/24/1999	12:55:15	7,480.00	283.51	9.64	298.6	90,727,973	290.63	2.52	0.0	98,911,770
08/24/1999	13:00:15	7,485.00	283.67	9.48	298.6	90,729,466	290.63	2.52	0.0	98,911,770
08/24/1999	13:05:15	7,490.00	283.28	9.87	298.6	90,730,959	290.63	2.52	0.0	98,911,770
08/24/1999	13:10:15	7,495.00	283.34	9.81	298.6	90,732,452	290.63	2.52	0.0	98,911,770
08/24/1999	13:15:15	7,500.00	283.65	9.50	298.6	90,733,946	290.63	2.52	0.0	98,911,770
08/24/1999	13:20:15	7,505.00	283.70	9.45	298.6	90,735,439	290.62	2.54	0.0	98,911,770
08/24/1999	13:25:15	7,510.00	283.43	9.73	298.6	90,736,932	290.62	2.54	0.0	98,911,770
08/24/1999	13:30:15	7,515.00	283.68	9.47	298.6	90,738,425	290.62	2.54	0.0	98,911,770
08/24/1999	13:35:15	7,520.00	283.36	9.79	298.6	90,739,919	290.60	2.55	0.0	98,911,770
08/24/1999	13:40:15	7,525.00	283.51	9.64	298.6	90,741,412	290.60	2.55	0.0	98,911,770
08/24/1999	13:45:15	7,530.00	283.56	9.59	298.6	90,742,905	290.60	2.55	0.0	98,911,770
08/24/1999	13:50:15	7,535.00	283.51	9.65	298.6	90,744,398	290.60	2.55	0.0	98,911,770
08/24/1999	13:55:15	7,540.00	283.58	9.58	298.6	90,745,892	290.59	2.57	0.0	98,911,770
08/24/1999	14:00:15	7,545.00	283.74	9.41	298.6	90,747,385	290.59	2.57	0.0	98,911,770
08/24/1999	14:05:15	7,550.00	283.74	9.41	298.6	90,748,878	290.59	2.57	0.0	98,911,770
08/24/1999	14:10:15	7,555.00	283.65	9.50	298.6	90,750,371	290.59	2.57	0.0	98,911,770
08/24/1999	14:15:15	7,560.00	283.58	9.57	298.6	90,751,865	290.59	2.57	0.0	98,911,770
08/24/1999	14:20:15	7,565.00	283.91	9.24	298.6	90,753,358	290.59	2.57	0.0	98,911,770
08/24/1999	14:25:15	7,570.00	283.65	9.50	298.6	90,754,851	290.59	2.57	0.0	98,911,770
08/24/1999	14:30:15	7,575.00	283.70	9.45	298.6	90,756,344	290.59	2.57	0.0	98,911,770
08/24/1999	14:35:15	7,580.00	283.61	9.54	298.6	90,757,837	290.59	2.57	0.0	98,911,770
08/24/1999	14:40:15	7,585.00	283.56	9.59	298.6	90,759,331	290.57	2.58	0.0	98,911,770
08/24/1999	14:45:15	7,590.00	283.62	9.53	298.6	90,760,824	290.57	2.58	0.0	98,911,770
08/24/1999	14:50:15	7,595.00	283.61	9.54	298.6	90,762,317	290.57	2.58	0.0	98,911,770
08/24/1999	14:55:15	7,600.00	283.54	9.62	298.6	90,763,810	290.56	2.60	0.0	98,911,770
08/24/1999	15:00:15	7,605.00	283.89	9.26	298.6	90,765,304	290.57	2.58	0.0	98,911,770
08/24/1999	15:05:15	7,610.00	283.81	9.34	298.6	90,766,797	290.56	2.60	0.0	98,911,770
08/24/1999	15:10:15	7,615.00	283.60	9.55	298.6	90,768,290	290.56	2.60	0.0	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/24/1999	15:15:15	7,620.00	283.54	9.62	298.6	90,769,783	290.56	2.60	0.0	98,911,770
08/24/1999	15:20:15	7,625.00	283.65	9.50	298.6	90,771,277	290.54	2.61	0.0	98,911,770
08/24/1999	15:25:15	7,630.00	283.49	9.66	298.6	90,772,770	290.54	2.61	0.0	98,911,770
08/24/1999	15:30:15	7,635.00	283.66	9.49	298.6	90,774,263	290.54	2.61	0.0	98,911,770
08/24/1999	15:35:15	7,640.00	283.70	9.45	298.6	90,775,756	290.54	2.61	0.0	98,911,770
08/24/1999	15:40:15	7,645.00	283.73	9.43	298.6	90,777,250	290.54	2.61	0.0	98,911,770
08/24/1999	15:45:15	7,650.00	283.67	9.48	298.6	90,778,743	290.54	2.61	0.0	98,911,770
08/24/1999	15:50:15	7,655.00	283.72	9.43	298.6	90,780,236	290.52	2.63	0.0	98,911,770
08/24/1999	15:55:15	7,660.00	283.59	9.56	298.6	90,781,729	290.52	2.63	0.0	98,911,770
08/24/1999	16:00:15	7,665.00	283.65	9.50	298.6	90,783,223	290.52	2.63	0.0	98,911,770
08/24/1999	16:05:15	7,670.00	283.82	9.33	298.6	90,784,716	290.52	2.63	0.0	98,911,770
08/24/1999	16:10:15	7,675.00	283.69	9.47	298.6	90,786,209	290.51	2.65	0.0	98,911,770
08/24/1999	16:15:15	7,680.00	283.80	9.35	298.6	90,787,702	290.51	2.65	0.0	98,911,770
08/24/1999	16:20:15	7,685.00	283.73	9.43	298.6	90,789,196	290.51	2.65	0.0	98,911,770
08/24/1999	16:25:15	7,690.00	283.46	9.69	298.6	90,790,689	290.51	2.65	0.0	98,911,770
08/24/1999	16:30:15	7,695.00	283.84	9.32	298.6	90,792,182	290.49	2.66	0.0	98,911,770
08/24/1999	16:35:15	7,700.00	283.69	9.47	298.6	90,793,675	290.51	2.65	0.0	98,911,770
08/24/1999	16:40:15	7,705.00	283.59	9.56	298.6	90,795,168	290.49	2.66	0.0	98,911,770
08/24/1999	16:45:15	7,710.00	283.51	9.64	298.6	90,796,662	290.49	2.66	0.0	98,911,770
08/24/1999	16:50:15	7,715.00	283.54	9.62	298.6	90,798,155	290.48	2.68	0.0	98,911,770
08/24/1999	16:55:15	7,720.00	283.54	9.62	298.6	90,799,648	290.48	2.68	0.0	98,911,770
08/24/1999	17:00:15	7,725.00	283.83	9.32	298.6	90,801,141	290.48	2.68	0.0	98,911,770
08/24/1999	17:05:15	7,730.00	283.52	9.63	298.6	90,802,635	290.48	2.68	0.0	98,911,770
08/24/1999	17:10:15	7,735.00	283.70	9.45	298.6	90,804,128	290.48	2.68	0.0	98,911,770
08/24/1999	17:15:15	7,740.00	283.46	9.69	298.6	90,805,621	290.48	2.68	0.0	98,911,770
08/24/1999	17:20:15	7,745.00	283.69	9.46	298.6	90,807,114	290.48	2.68	0.0	98,911,770
08/24/1999	17:25:15	7,750.00	283.68	9.47	298.6	90,808,608	290.46	2.69	0.0	98,911,770
08/24/1999	17:30:15	7,755.00	283.69	9.46	298.6	90,810,101	290.46	2.69	0.0	98,911,770
08/24/1999	17:35:15	7,760.00	283.65	9.50	298.6	90,811,594	290.46	2.69	0.0	98,911,770
08/24/1999	17:40:15	7,765.00	283.38	9.77	298.6	90,813,087	290.44	2.71	0.0	98,911,770
08/24/1999	17:45:15	7,770.00	283.55	9.60	298.6	90,814,581	290.44	2.71	0.0	98,911,770
08/24/1999	17:50:15	7,775.00	283.44	9.71	298.6	90,816,074	290.44	2.71	0.0	98,911,770
08/24/1999	17:55:15	7,780.00	283.42	9.73	298.6	90,817,567	290.44	2.71	0.0	98,911,770
08/24/1999	18:00:15	7,785.00	283.65	9.50	298.6	90,819,060	290.44	2.71	0.0	98,911,770
08/24/1999	18:05:15	7,790.00	283.36	9.79	298.6	90,820,554	290.44	2.71	0.0	98,911,770
08/24/1999	18:10:15	7,795.00	283.55	9.61	298.6	90,822,047	290.43	2.72	0.0	98,911,770
08/24/1999	18:15:15	7,800.00	283.40	9.76	298.6	90,823,540	290.43	2.72	0.0	98,911,770
08/24/1999	18:20:15	7,805.00	283.46	9.69	298.6	90,825,033	290.43	2.72	0.0	98,911,770
08/24/1999	18:25:15	7,810.00	283.35	9.80	298.6	90,826,526	290.43	2.72	0.0	98,911,770
08/24/1999	18:30:15	7,815.00	283.69	9.46	298.6	90,828,020	290.43	2.72	0.0	98,911,770
08/24/1999	18:35:15	7,820.00	283.46	9.69	298.6	90,829,513	290.41	2.74	0.0	98,911,770
08/24/1999	18:40:15	7,825.00	283.34	9.81	298.6	90,831,006	290.41	2.74	0.0	98,911,770
08/24/1999	18:45:15	7,830.00	283.46	9.69	298.6	90,832,499	290.41	2.74	0.0	98,911,770
08/24/1999	18:50:15	7,835.00	283.49	9.66	298.6	90,833,993	290.41	2.74	0.0	98,911,770
08/24/1999	18:55:15	7,840.00	283.25	9.91	298.6	90,835,486	290.40	2.75	0.0	98,911,770
08/24/1999	19:00:15	7,845.00	283.40	9.75	298.6	90,836,979	290.40	2.75	0.0	98,911,770
08/24/1999	19:05:15	7,850.00	283.60	9.55	298.6	90,838,472	290.40	2.75	0.0	98,911,770
08/24/1999	19:10:15	7,855.00	283.40	9.75	298.6	90,839,966	290.40	2.75	0.0	98,911,770
08/24/1999	19:15:15	7,860.00	283.52	9.63	298.6	90,841,459	290.40	2.75	0.0	98,911,770
08/24/1999	19:20:15	7,865.00	283.60	9.55	298.6	90,842,952	290.40	2.75	0.0	98,911,770
08/24/1999	19:25:15	7,870.00	283.37	9.78	298.6	90,844,445	290.38	2.77	0.0	98,911,770
08/24/1999	19:30:15	7,875.00	283.32	9.83	298.6	90,845,939	290.38	2.77	0.0	98,911,770
08/24/1999	19:35:15	7,880.00	283.55	9.60	298.6	90,847,432	290.38	2.77	0.0	98,911,770
08/24/1999	19:40:15	7,885.00	283.55	9.61	298.6	90,848,925	290.38	2.77	0.0	98,911,770
08/24/1999	19:45:15	7,890.00	283.47	9.68	298.6	90,850,418	290.38	2.77	0.0	98,911,770
08/24/1999	19:50:15	7,895.00	283.49	9.66	298.6	90,851,912	290.37	2.79	0.0	98,911,770
08/24/1999	19:55:15	7,900.00	283.43	9.73	298.6	90,853,405	290.37	2.79	0.0	98,911,770
08/24/1999	20:00:15	7,905.00	283.40	9.76	298.6	90,854,898	290.37	2.79	0.0	98,911,770
08/24/1999	20:05:15	7,910.00	283.36	9.80	298.6	90,856,391	290.37	2.79	0.0	98,911,770
08/24/1999	20:10:15	7,915.00	283.16	9.99	298.6	90,857,885	290.35	2.80	0.0	98,911,770
08/24/1999	20:15:15	7,920.00	283.41	9.74	298.6	90,859,378	290.37	2.79	0.0	98,911,770
08/24/1999	20:20:15	7,925.00	283.46	9.69	298.6	90,860,871	290.35	2.80	0.0	98,911,770
08/24/1999	20:25:15	7,930.00	283.60	9.55	298.6	90,862,364	290.35	2.80	0.0	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/24/1999	20:30:15	7,935.00	283.28	9.87	298.6	90,863,857	290.35	2.80	0.0	98,911,770
08/24/1999	20:35:15	7,940.00	283.36	9.79	298.6	90,865,351	290.33	2.82	0.0	98,911,770
08/24/1999	20:40:15	7,945.00	283.13	10.02	298.6	90,866,844	290.33	2.82	0.0	98,911,770
08/24/1999	20:45:15	7,950.00	283.63	9.52	298.6	90,868,337	290.33	2.82	0.0	98,911,770
08/24/1999	20:50:15	7,955.00	283.36	9.79	298.6	90,869,830	290.33	2.82	0.0	98,911,770
08/24/1999	20:55:15	7,960.00	283.42	9.73	298.6	90,871,324	290.33	2.82	0.0	98,911,770
08/24/1999	21:00:15	7,965.00	283.32	9.83	298.6	90,872,817	290.33	2.82	0.0	98,911,770
08/24/1999	21:05:15	7,970.00	283.22	9.93	298.6	90,874,310	290.32	2.84	0.0	98,911,770
08/24/1999	21:10:15	7,975.00	283.54	9.62	298.6	90,875,803	290.32	2.84	0.0	98,911,770
08/24/1999	21:15:15	7,980.00	283.48	9.67	298.6	90,877,297	290.32	2.84	0.0	98,911,770
08/24/1999	21:20:15	7,985.00	283.37	9.78	298.6	90,878,790	290.32	2.84	0.0	98,911,770
08/24/1999	21:25:15	7,990.00	283.40	9.76	298.6	90,880,283	290.32	2.84	0.0	98,911,770
08/24/1999	21:30:15	7,995.00	283.55	9.60	298.6	90,881,776	290.32	2.84	0.0	98,911,770
08/24/1999	21:35:15	8,000.00	283.30	9.85	298.6	90,883,270	290.32	2.84	0.0	98,911,770
08/24/1999	21:40:15	8,005.00	283.24	9.91	298.6	90,884,763	290.30	2.85	0.0	98,911,770
08/24/1999	21:45:15	8,010.00	283.13	10.02	298.6	90,886,256	290.30	2.85	0.0	98,911,770
08/24/1999	21:50:15	8,015.00	283.10	10.06	298.6	90,887,749	290.30	2.85	0.0	98,911,770
08/24/1999	21:55:15	8,020.00	283.33	9.82	298.6	90,889,243	290.30	2.85	0.0	98,911,770
08/24/1999	22:00:15	8,025.00	283.30	9.85	298.6	90,890,736	290.30	2.85	0.0	98,911,770
08/24/1999	22:05:15	8,030.00	283.14	10.01	298.6	90,892,229	290.30	2.85	0.0	98,911,770
08/24/1999	22:10:15	8,035.00	283.15	10.00	298.6	90,893,722	290.29	2.87	0.0	98,911,770
08/24/1999	22:15:15	8,040.00	283.43	9.72	298.6	90,895,216	290.29	2.87	0.0	98,911,770
08/24/1999	22:20:15	8,045.00	283.59	9.56	298.6	90,896,709	290.29	2.87	0.0	98,911,770
08/24/1999	22:25:15	8,050.00	283.43	9.73	298.6	90,898,202	290.29	2.87	0.0	98,911,770
08/24/1999	22:30:15	8,055.00	283.44	9.71	298.6	90,899,695	290.29	2.87	0.0	98,911,770
08/24/1999	22:35:15	8,060.00	283.26	9.89	298.6	90,901,188	290.29	2.87	0.0	98,911,770
08/24/1999	22:40:15	8,065.00	283.47	9.68	298.6	90,902,682	290.27	2.88	0.0	98,911,770
08/24/1999	22:45:15	8,070.00	283.17	9.98	298.6	90,904,175	290.27	2.88	0.0	98,911,770
08/24/1999	22:50:15	8,075.00	283.32	9.83	298.6	90,905,668	290.27	2.88	0.0	98,911,770
08/24/1999	22:55:15	8,080.00	283.12	10.03	298.6	90,907,161	290.27	2.88	0.0	98,911,770
08/24/1999	23:00:15	8,085.00	283.46	9.69	298.6	90,908,655	290.27	2.88	0.0	98,911,770
08/24/1999	23:05:15	8,090.00	282.99	10.17	298.6	90,910,148	290.26	2.90	0.0	98,911,770
08/24/1999	23:10:15	8,095.00	283.19	9.96	298.6	90,911,641	290.26	2.90	0.0	98,911,770
08/24/1999	23:15:15	8,100.00	283.06	10.09	298.6	90,913,134	290.26	2.90	0.0	98,911,770
08/24/1999	23:20:15	8,105.00	283.50	9.65	298.6	90,914,628	290.26	2.90	0.0	98,911,770
08/24/1999	23:25:15	8,110.00	282.93	10.22	298.6	90,916,121	290.26	2.90	0.0	98,911,770
08/24/1999	23:30:15	8,115.00	283.37	9.78	298.6	90,917,614	290.26	2.90	0.0	98,911,770
08/24/1999	23:35:15	8,120.00	283.28	9.87	298.6	90,919,107	290.26	2.90	0.0	98,911,770
08/24/1999	23:40:15	8,125.00	283.15	10.00	298.6	90,920,601	290.24	2.91	0.0	98,911,770
08/24/1999	23:45:15	8,130.00	283.50	9.65	298.6	90,922,094	290.24	2.91	0.0	98,911,770
08/24/1999	23:50:15	8,135.00	283.10	10.06	298.6	90,923,587	290.24	2.91	0.0	98,911,770
08/24/1999	23:55:15	8,140.00	283.53	9.62	298.6	90,925,080	290.24	2.91	0.0	98,911,770
08/25/1999	0:00:15	8,145.00	283.39	9.77	298.6	90,926,574	290.24	2.91	0.0	98,911,770
08/25/1999	0:05:15	8,150.00	283.42	9.73	298.6	90,928,067	290.22	2.93	0.0	98,911,770
08/25/1999	0:10:15	8,155.00	283.40	9.75	298.6	90,929,560	290.22	2.93	0.0	98,911,770
08/25/1999	0:15:15	8,160.00	283.27	9.88	298.6	90,931,053	290.22	2.93	0.0	98,911,770
08/25/1999	0:20:15	8,165.00	283.36	9.79	298.6	90,932,546	290.22	2.93	0.0	98,911,770
08/25/1999	0:25:15	8,170.00	283.48	9.67	298.6	90,934,040	290.22	2.93	0.0	98,911,770
08/25/1999	0:30:15	8,175.00	283.14	10.01	298.6	90,935,533	290.22	2.93	0.0	98,911,770
08/25/1999	0:35:15	8,180.00	282.99	10.16	298.6	90,937,026	290.21	2.94	0.0	98,911,770
08/25/1999	0:40:15	8,185.00	282.99	10.17	298.6	90,938,519	290.21	2.94	0.0	98,911,770
08/25/1999	0:45:15	8,190.00	283.06	10.10	298.6	90,940,013	290.21	2.94	0.0	98,911,770
08/25/1999	0:50:15	8,195.00	283.17	9.98	298.6	90,941,506	290.21	2.94	0.0	98,911,770
08/25/1999	0:55:15	8,200.00	283.45	9.70	298.6	90,942,999	290.21	2.94	0.0	98,911,770
08/25/1999	1:00:15	8,205.00	283.02	10.13	298.6	90,944,492	290.21	2.94	0.0	98,911,770
08/25/1999	1:05:15	8,210.00	283.24	9.91	298.6	90,945,986	290.19	2.96	0.0	98,911,770
08/25/1999	1:10:15	8,215.00	283.43	9.72	298.6	90,947,479	290.19	2.96	0.0	98,911,770
08/25/1999	1:15:15	8,220.00	282.92	10.23	298.6	90,948,972	290.19	2.96	0.0	98,911,770
08/25/1999	1:20:15	8,225.00	283.15	10.00	298.6	90,950,465	290.18	2.98	0.0	98,911,770
08/25/1999	1:25:15	8,230.00	283.34	9.81	298.6	90,951,959	290.18	2.98	0.0	98,911,770
08/25/1999	1:30:15	8,235.00	282.99	10.17	298.6	90,953,452	290.18	2.98	0.0	98,911,770
08/25/1999	1:35:15	8,240.00	283.29	9.86	298.6	90,954,945	290.18	2.98	0.0	98,911,770
08/25/1999	1:40:15	8,245.00	283.29	9.86	298.6	90,956,438	290.18	2.98	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/25/1999	1:45:15	8,250.00	283.07	10.08	298.6	90,957,932	290.18	2.98	0.0	98,911,770
08/25/1999	1:50:15	8,255.00	283.28	9.87	298.6	90,959,425	290.18	2.98	0.0	98,911,770
08/25/1999	1:55:15	8,260.00	282.84	10.32	298.6	90,960,918	290.16	2.99	0.0	98,911,770
08/25/1999	2:00:15	8,265.00	283.23	9.92	298.6	90,962,411	290.16	2.99	0.0	98,911,770
08/25/1999	2:05:15	8,270.00	282.84	10.32	298.6	90,963,905	290.16	2.99	0.0	98,911,770
08/25/1999	2:10:15	8,275.00	283.08	10.07	298.6	90,965,398	290.16	2.99	0.0	98,911,770
08/25/1999	2:15:15	8,280.00	283.03	10.12	298.6	90,966,891	290.16	2.99	0.0	98,911,770
08/25/1999	2:20:15	8,285.00	283.19	9.96	298.6	90,968,384	290.15	3.01	0.0	98,911,770
08/25/1999	2:25:15	8,290.00	282.86	10.29	298.6	90,969,877	290.15	3.01	0.0	98,911,770
08/25/1999	2:30:15	8,295.00	283.03	10.12	298.6	90,971,371	290.15	3.01	0.0	98,911,770
08/25/1999	2:35:15	8,300.00	282.79	10.36	298.6	90,972,864	290.15	3.01	0.0	98,911,770
08/25/1999	2:40:15	8,305.00	283.00	10.15	298.6	90,974,357	290.15	3.01	0.0	98,911,770
08/25/1999	2:45:15	8,310.00	282.86	10.29	298.6	90,975,850	290.13	3.02	0.0	98,911,770
08/25/1999	2:50:15	8,315.00	283.19	9.96	298.6	90,977,344	290.15	3.01	0.0	98,911,770
08/25/1999	2:55:15	8,320.00	282.71	10.44	298.6	90,978,837	290.13	3.02	0.0	98,911,770
08/25/1999	3:00:15	8,325.00	283.36	9.79	298.6	90,980,330	290.13	3.02	0.0	98,911,770
08/25/1999	3:05:15	8,330.00	282.75	10.40	298.6	90,981,823	290.13	3.02	0.0	98,911,770
08/25/1999	3:10:15	8,335.00	282.92	10.23	298.6	90,983,317	290.13	3.02	0.0	98,911,770
08/25/1999	3:15:15	8,340.00	283.17	9.98	298.6	90,984,810	290.13	3.02	0.0	98,911,770
08/25/1999	3:20:15	8,345.00	283.02	10.13	298.6	90,986,303	290.12	3.04	0.0	98,911,770
08/25/1999	3:25:15	8,350.00	283.08	10.07	298.6	90,987,796	290.12	3.04	0.0	98,911,770
08/25/1999	3:30:15	8,355.00	282.96	10.19	298.6	90,989,290	290.12	3.04	0.0	98,911,770
08/25/1999	3:35:15	8,360.00	283.23	9.92	298.6	90,990,783	290.12	3.04	0.0	98,911,770
08/25/1999	3:40:15	8,365.00	283.36	9.80	298.6	90,992,276	290.12	3.04	0.0	98,911,770
08/25/1999	3:45:15	8,370.00	282.82	10.33	298.6	90,993,769	290.12	3.04	0.0	98,911,770
08/25/1999	3:50:15	8,375.00	283.05	10.10	298.6	90,995,263	290.10	3.05	0.0	98,911,770
08/25/1999	3:55:15	8,380.00	283.34	9.81	298.6	90,996,756	290.10	3.05	0.0	98,911,770
08/25/1999	4:00:15	8,385.00	283.02	10.13	298.6	90,998,249	290.10	3.05	0.0	98,911,770
08/25/1999	4:05:15	8,390.00	283.05	10.10	298.6	90,999,742	290.10	3.05	0.0	98,911,770
08/25/1999	4:10:15	8,395.00	282.91	10.25	298.6	91,001,235	290.10	3.05	0.0	98,911,770
08/25/1999	4:15:15	8,400.00	282.70	10.45	298.6	91,002,729	290.10	3.05	0.0	98,911,770
08/25/1999	4:20:15	8,405.00	282.96	10.19	298.6	91,004,222	290.10	3.05	0.0	98,911,770
08/25/1999	4:25:15	8,410.00	282.96	10.19	298.6	91,005,715	290.08	3.07	0.0	98,911,770
08/25/1999	4:30:15	8,415.00	283.19	9.96	298.6	91,007,208	290.08	3.07	0.0	98,911,770
08/25/1999	4:35:15	8,420.00	283.04	10.11	298.6	91,008,702	290.08	3.07	0.0	98,911,770
08/25/1999	4:40:15	8,425.00	283.21	9.94	298.6	91,010,195	290.08	3.07	0.0	98,911,770
08/25/1999	4:45:15	8,430.00	282.99	10.16	298.6	91,011,688	290.07	3.09	0.0	98,911,770
08/25/1999	4:50:15	8,435.00	283.05	10.10	298.6	91,013,181	290.07	3.09	0.0	98,911,770
08/25/1999	4:55:15	8,440.00	283.24	9.91	298.6	91,014,675	290.08	3.07	0.0	98,911,770
08/25/1999	5:00:15	8,445.00	282.82	10.33	298.6	91,016,168	290.07	3.09	0.0	98,911,770
08/25/1999	5:05:15	8,450.00	283.36	9.80	298.6	91,017,661	290.07	3.09	0.0	98,911,770
08/25/1999	5:10:15	8,455.00	282.91	10.25	298.6	91,019,154	290.07	3.09	0.0	98,911,770
08/25/1999	5:15:15	8,460.00	283.32	9.83	298.6	91,020,648	290.07	3.09	0.0	98,911,770
08/25/1999	5:20:15	8,465.00	283.23	9.92	298.6	91,022,141	290.07	3.09	0.0	98,911,770
08/25/1999	5:25:15	8,470.00	282.92	10.23	298.6	91,023,634	290.05	3.10	0.0	98,911,770
08/25/1999	5:30:15	8,475.00	282.92	10.23	298.6	91,025,127	290.05	3.10	0.0	98,911,770
08/25/1999	5:35:15	8,480.00	283.21	9.95	298.6	91,026,621	290.05	3.10	0.0	98,911,770
08/25/1999	5:40:15	8,485.00	283.22	9.93	298.6	91,028,114	290.05	3.10	0.0	98,911,770
08/25/1999	5:45:15	8,490.00	282.99	10.16	298.6	91,029,607	290.04	3.12	0.0	98,911,770
08/25/1999	5:50:15	8,495.00	283.30	9.85	298.6	91,031,100	290.04	3.12	0.0	98,911,770
08/25/1999	5:55:15	8,500.00	283.01	10.14	298.6	91,032,594	290.04	3.12	0.0	98,911,770
08/25/1999	6:00:15	8,505.00	283.20	9.95	298.6	91,034,087	290.04	3.12	0.0	98,911,770
08/25/1999	6:05:15	8,510.00	282.81	10.34	298.6	91,035,580	290.04	3.12	0.0	98,911,770
08/25/1999	6:10:15	8,515.00	283.09	10.06	298.6	91,037,073	290.04	3.12	0.0	98,911,770
08/25/1999	6:15:15	8,520.00	282.90	10.25	298.6	91,038,566	290.04	3.12	0.0	98,911,770
08/25/1999	6:20:15	8,525.00	282.87	10.28	298.6	91,040,060	290.02	3.13	0.0	98,911,770
08/25/1999	6:25:15	8,530.00	282.92	10.24	298.6	91,041,553	290.02	3.13	0.0	98,911,770
08/25/1999	6:30:15	8,535.00	282.81	10.35	298.6	91,043,046	290.02	3.13	0.0	98,911,770
08/25/1999	6:35:15	8,540.00	283.11	10.04	298.6	91,044,539	290.02	3.13	0.0	98,911,770
08/25/1999	6:40:15	8,545.00	282.88	10.27	298.6	91,046,033	290.02	3.13	0.0	98,911,770
08/25/1999	6:45:15	8,550.00	282.86	10.29	298.6	91,047,526	290.02	3.13	0.0	98,911,770
08/25/1999	6:50:15	8,555.00	282.78	10.37	298.6	91,049,019	290.00	3.15	0.0	98,911,770
08/25/1999	6:55:15	8,560.00	282.87	10.28	298.6	91,050,512	290.00	3.15	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/25/1999	7:00:15	8,565.00	283.35	9.80	298.6	91,052,006	290.00	3.15	0.0	98,911,770
08/25/1999	7:05:15	8,570.00	282.90	10.25	298.6	91,053,499	289.99	3.17	0.0	98,911,770
08/25/1999	7:10:15	8,575.00	282.85	10.30	298.6	91,054,992	290.00	3.15	0.0	98,911,770
08/25/1999	7:15:15	8,580.00	283.25	9.90	298.6	91,056,485	290.00	3.15	0.0	98,911,770
08/25/1999	7:20:15	8,585.00	282.77	10.38	298.6	91,057,979	289.99	3.17	0.0	98,911,770
08/25/1999	7:25:15	8,590.00	282.46	10.69	298.6	91,059,472	289.99	3.17	0.0	98,911,770
08/25/1999	7:30:15	8,595.00	282.31	10.84	298.6	91,060,965	289.97	3.18	0.0	98,911,770
08/25/1999	7:35:15	8,600.00	282.74	10.41	298.6	91,062,458	289.99	3.17	0.0	98,911,770
08/25/1999	7:40:15	8,605.00	282.96	10.19	298.6	91,063,952	289.97	3.18	0.0	98,911,770
08/25/1999	7:45:15	8,610.00	282.47	10.69	298.6	91,065,445	289.97	3.18	0.0	98,911,770
08/25/1999	7:50:15	8,615.00	282.33	10.82	298.6	91,066,938	289.97	3.18	0.0	98,911,770
08/25/1999	7:55:15	8,620.00	282.68	10.47	298.6	91,068,431	289.97	3.18	0.0	98,911,770
08/25/1999	8:00:15	8,625.00	283.02	10.13	298.6	91,069,925	289.97	3.18	0.0	98,911,770
08/25/1999	8:05:15	8,630.00	282.92	10.24	298.6	91,071,418	289.96	3.20	0.0	98,911,770
08/25/1999	8:10:15	8,635.00	282.61	10.55	298.6	91,072,911	289.97	3.18	0.0	98,911,770
08/25/1999	8:15:15	8,640.00	282.77	10.39	298.6	91,074,404	289.96	3.20	0.0	98,911,770
08/25/1999	8:20:15	8,645.00	282.51	10.65	298.6	91,075,897	289.96	3.20	0.0	98,911,770
08/25/1999	8:25:15	8,650.00	282.39	10.76	298.6	91,077,391	289.96	3.20	0.0	98,911,770
08/25/1999	8:30:15	8,655.00	282.87	10.28	298.6	91,078,884	289.96	3.20	0.0	98,911,770
08/25/1999	8:35:15	8,660.00	282.82	10.33	298.6	91,080,377	289.94	3.21	0.0	98,911,770
08/25/1999	8:40:15	8,665.00	282.28	10.87	298.6	91,081,870	289.94	3.21	0.0	98,911,770
08/25/1999	8:45:15	8,670.00	282.84	10.32	298.6	91,083,364	289.94	3.21	0.0	98,911,770
08/25/1999	8:50:15	8,675.00	282.69	10.46	298.6	91,084,857	289.94	3.21	0.0	98,911,770
08/25/1999	8:55:15	8,680.00	282.17	10.99	298.6	91,086,350	289.93	3.23	0.0	98,911,770
08/25/1999	9:00:15	8,685.00	282.28	10.88	298.6	91,087,843	289.94	3.21	0.0	98,911,770
08/25/1999	9:05:15	8,690.00	282.51	10.65	298.6	91,089,337	289.93	3.23	0.0	98,911,770
08/25/1999	9:10:15	8,695.00	282.66	10.49	298.6	91,090,830	289.93	3.23	0.0	98,911,770
08/25/1999	9:15:15	8,700.00	283.10	10.06	298.6	91,092,323	289.93	3.23	0.0	98,911,770
08/25/1999	9:20:15	8,705.00	282.84	10.31	298.6	91,093,816	289.93	3.23	0.0	98,911,770
08/25/1999	9:25:15	8,710.00	282.82	10.33	298.6	91,095,310	289.93	3.23	0.0	98,911,770
08/25/1999	9:30:15	8,715.00	282.43	10.73	298.6	91,096,803	289.91	3.24	0.0	98,911,770
08/25/1999	9:35:15	8,720.00	282.65	10.51	298.6	91,098,296	289.91	3.24	0.0	98,911,770
08/25/1999	9:40:15	8,725.00	282.53	10.62	298.6	91,099,789	289.91	3.24	0.0	98,911,770
08/25/1999	9:45:15	8,730.00	282.95	10.21	298.6	91,101,283	289.91	3.24	0.0	98,911,770
08/25/1999	9:50:15	8,735.00	282.47	10.69	298.6	91,102,776	289.91	3.24	0.0	98,911,770
08/25/1999	9:55:15	8,740.00	282.62	10.54	298.6	91,104,269	289.91	3.24	0.0	98,911,770
08/25/1999	10:00:15	8,745.00	282.94	10.21	298.6	91,105,762	289.89	3.26	0.0	98,911,770
08/25/1999	10:05:15	8,750.00	282.64	10.51	298.6	91,107,255	289.91	3.24	0.0	98,911,770
08/25/1999	10:10:15	8,755.00	282.98	10.17	298.6	91,108,749	289.89	3.26	0.0	98,911,770
08/25/1999	10:15:15	8,760.00	282.45	10.70	298.6	91,110,242	289.89	3.26	0.0	98,911,770
08/25/1999	10:20:15	8,765.00	282.19	10.96	298.6	91,111,735	289.89	3.26	0.0	98,911,770
08/25/1999	10:25:15	8,770.00	282.62	10.54	298.6	91,113,228	289.89	3.26	0.0	98,911,770
08/25/1999	10:30:15	8,775.00	282.79	10.36	298.6	91,114,722	289.89	3.26	0.0	98,911,770
08/25/1999	10:35:15	8,780.00	282.89	10.26	298.6	91,116,215	289.88	3.28	0.0	98,911,770
08/25/1999	10:40:15	8,785.00	282.23	10.92	298.6	91,117,708	289.88	3.28	0.0	98,911,770
08/25/1999	10:45:15	8,790.00	282.70	10.45	298.6	91,119,201	289.88	3.28	0.0	98,911,770
08/25/1999	10:50:15	8,795.00	282.61	10.55	298.6	91,120,695	289.88	3.28	0.0	98,911,770
08/25/1999	10:55:15	8,800.00	282.75	10.40	298.6	91,122,188	289.88	3.28	0.0	98,911,770
08/25/1999	11:00:15	8,805.00	282.33	10.83	298.6	91,123,681	289.88	3.28	0.0	98,911,770
08/25/1999	11:05:15	8,810.00	282.42	10.73	298.6	91,125,174	289.88	3.28	0.0	98,911,770
08/25/1999	11:10:15	8,815.00	282.56	10.59	298.6	91,126,668	289.86	3.29	0.0	98,911,770
08/25/1999	11:15:15	8,820.00	282.84	10.31	298.6	91,128,161	289.86	3.29	0.0	98,911,770
08/25/1999	11:20:15	8,825.00	282.96	10.20	298.6	91,129,654	289.86	3.29	0.0	98,911,770
08/25/1999	11:25:15	8,830.00	282.58	10.58	298.6	91,131,147	289.86	3.29	0.0	98,911,770
08/25/1999	11:30:15	8,835.00	282.39	10.76	298.6	91,132,641	289.86	3.29	0.0	98,911,770
08/25/1999	11:35:15	8,840.00	282.38	10.77	298.6	91,134,134	289.85	3.31	0.0	98,911,770
08/25/1999	11:40:15	8,845.00	282.47	10.68	298.6	91,135,627	289.85	3.31	0.0	98,911,770
08/25/1999	11:45:15	8,850.00	282.29	10.86	298.6	91,137,120	289.85	3.31	0.0	98,911,770
08/25/1999	11:50:15	8,855.00	282.60	10.55	298.6	91,138,614	289.85	3.31	0.0	98,911,770
08/25/1999	11:55:15	8,860.00	282.91	10.25	298.6	91,140,107	289.85	3.31	0.0	98,911,770
08/25/1999	12:00:15	8,865.00	282.86	10.29	298.6	91,141,600	289.85	3.31	0.0	98,911,770
08/25/1999	12:05:15	8,870.00	282.72	10.43	297.2	91,143,086	289.85	3.31	0.0	98,911,770
08/25/1999	12:10:15	8,875.00	282.73	10.42	297.2	91,144,572	289.83	3.32	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/25/1999	12:15:15	8,880.00	282.17	10.99	297.2	91,146,058	289.83	3.32	0.0	98,911,770
08/25/1999	12:20:15	8,885.00	282.41	10.74	297.2	91,147,544	289.83	3.32	0.0	98,911,770
08/25/1999	12:25:15	8,890.00	282.56	10.59	297.2	91,149,030	289.83	3.32	0.0	98,911,770
08/25/1999	12:30:15	8,895.00	282.68	10.47	297.2	91,150,516	289.83	3.32	0.0	98,911,770
08/25/1999	12:35:15	8,900.00	282.35	10.80	297.2	91,152,002	289.83	3.32	0.0	98,911,770
08/25/1999	12:40:15	8,905.00	282.52	10.63	297.2	91,153,488	289.82	3.34	0.0	98,911,770
08/25/1999	12:45:15	8,910.00	282.18	10.98	297.2	91,154,974	289.82	3.34	0.0	98,911,770
08/25/1999	12:50:15	8,915.00	282.60	10.55	297.2	91,156,460	289.83	3.32	0.0	98,911,770
08/25/1999	12:55:15	8,920.00	282.92	10.23	297.2	91,157,946	289.82	3.34	0.0	98,911,770
08/25/1999	13:00:15	8,925.00	282.61	10.55	297.2	91,159,432	289.82	3.34	0.0	98,911,770
08/25/1999	13:05:15	8,930.00	282.47	10.69	297.2	91,160,918	289.82	3.34	0.0	98,911,770
08/25/1999	13:10:15	8,935.00	282.04	11.11	297.2	91,162,404	289.82	3.34	0.0	98,911,770
08/25/1999	13:15:15	8,940.00	282.39	10.76	297.2	91,163,890	289.82	3.34	0.0	98,911,770
08/25/1999	13:20:15	8,945.00	282.18	10.98	297.2	91,165,376	289.82	3.34	0.0	98,911,770
08/25/1999	13:25:15	8,950.00	282.81	10.34	297.2	91,166,862	289.80	3.35	0.0	98,911,770
08/25/1999	13:30:15	8,955.00	282.54	10.61	297.2	91,168,348	289.82	3.34	0.0	98,911,770
08/25/1999	13:35:15	8,960.00	282.95	10.21	297.2	91,169,834	289.82	3.34	0.0	98,911,770
08/25/1999	13:40:15	8,965.00	282.09	11.06	297.2	91,171,320	289.80	3.35	0.0	98,911,770
08/25/1999	13:45:15	8,970.00	282.60	10.55	297.2	91,172,806	289.80	3.35	0.0	98,911,770
08/25/1999	13:50:15	8,975.00	282.51	10.65	297.2	91,174,292	289.82	3.34	0.0	98,911,770
08/25/1999	13:55:15	8,980.00	282.68	10.47	297.2	91,175,778	289.80	3.35	0.0	98,911,770
08/25/1999	14:00:15	8,985.00	282.85	10.30	297.2	91,177,264	289.80	3.35	0.0	98,911,770
08/25/1999	14:05:15	8,990.00	282.83	10.32	297.2	91,178,750	289.80	3.35	0.0	98,911,770
08/25/1999	14:10:15	8,995.00	282.68	10.47	297.2	91,180,236	289.80	3.35	0.0	98,911,770
08/25/1999	14:15:15	9,000.00	282.86	10.29	297.2	91,181,722	289.80	3.35	0.0	98,911,770
08/25/1999	14:20:15	9,005.00	282.93	10.22	297.2	91,183,208	289.80	3.35	0.0	98,911,770
08/25/1999	14:25:15	9,010.00	282.33	10.82	297.2	91,184,694	289.78	3.37	0.0	98,911,770
08/25/1999	14:30:15	9,015.00	282.81	10.35	297.2	91,186,180	289.78	3.37	0.0	98,911,770
08/25/1999	14:35:15	9,020.00	282.35	10.80	297.2	91,187,666	289.78	3.37	0.0	98,911,770
08/25/1999	14:40:15	9,025.00	282.82	10.33	297.2	91,189,152	289.78	3.37	0.0	98,911,770
08/25/1999	14:45:15	9,030.00	282.78	10.37	297.2	91,190,638	289.78	3.37	0.0	98,911,770
08/25/1999	14:50:15	9,035.00	282.58	10.58	297.2	91,192,124	289.78	3.37	0.0	98,911,770
08/25/1999	14:55:15	9,040.00	282.45	10.70	297.2	91,193,610	289.77	3.39	0.0	98,911,770
08/25/1999	15:00:15	9,045.00	282.76	10.40	297.2	91,195,096	289.78	3.37	0.0	98,911,770
08/25/1999	15:05:15	9,050.00	282.03	11.13	297.2	91,196,582	289.77	3.39	0.0	98,911,770
08/25/1999	15:10:15	9,055.00	282.62	10.54	297.2	91,198,068	289.77	3.39	0.0	98,911,770
08/25/1999	15:15:15	9,060.00	282.87	10.28	297.2	91,199,554	289.77	3.39	0.0	98,911,770
08/25/1999	15:20:15	9,065.00	282.40	10.75	297.2	91,201,040	289.77	3.39	0.0	98,911,770
08/25/1999	15:25:15	9,070.00	282.72	10.43	297.2	91,202,526	289.77	3.39	0.0	98,911,770
08/25/1999	15:30:15	9,075.00	282.63	10.52	297.2	91,204,012	289.75	3.40	0.0	98,911,770
08/25/1999	15:35:15	9,080.00	282.46	10.69	297.2	91,205,498	289.77	3.39	0.0	98,911,770
08/25/1999	15:40:15	9,085.00	282.68	10.47	297.2	91,206,984	289.75	3.40	0.0	98,911,770
08/25/1999	15:45:15	9,090.00	282.85	10.30	297.2	91,208,470	289.75	3.40	0.0	98,911,770
08/25/1999	15:50:15	9,095.00	282.68	10.47	297.2	91,209,956	289.75	3.40	0.0	98,911,770
08/25/1999	15:55:15	9,100.00	282.92	10.23	297.2	91,211,442	289.75	3.40	0.0	98,911,770
08/25/1999	16:00:15	9,105.00	282.69	10.46	297.2	91,212,928	289.75	3.40	0.0	98,911,770
08/25/1999	16:05:15	9,110.00	282.59	10.56	297.2	91,214,414	289.75	3.40	0.0	98,911,770
08/25/1999	16:10:15	9,115.00	282.55	10.60	297.2	91,215,900	289.74	3.42	0.0	98,911,770
08/25/1999	16:15:15	9,120.00	282.72	10.43	297.2	91,217,386	289.74	3.42	0.0	98,911,770
08/25/1999	16:20:15	9,125.00	282.33	10.83	297.2	91,218,872	289.74	3.42	0.0	98,911,770
08/25/1999	16:25:15	9,130.00	282.96	10.20	297.2	91,220,358	289.74	3.42	0.0	98,911,770
08/25/1999	16:30:15	9,135.00	282.86	10.29	297.2	91,221,844	289.74	3.42	0.0	98,911,770
08/25/1999	16:35:15	9,140.00	282.40	10.75	297.2	91,223,330	289.74	3.42	0.0	98,911,770
08/25/1999	16:40:15	9,145.00	282.62	10.54	297.2	91,224,816	289.74	3.42	0.0	98,911,770
08/25/1999	16:45:15	9,150.00	282.47	10.68	297.2	91,226,302	289.72	3.43	0.0	98,911,770
08/25/1999	16:50:15	9,155.00	282.21	10.94	297.2	91,227,788	289.72	3.43	0.0	98,911,770
08/25/1999	16:55:15	9,160.00	282.97	10.18	297.2	91,229,274	289.72	3.43	0.0	98,911,770
08/25/1999	17:00:15	9,165.00	282.24	10.91	297.2	91,230,760	289.72	3.43	0.0	98,911,770
08/25/1999	17:05:15	9,170.00	282.30	10.85	297.2	91,232,246	289.72	3.43	0.0	98,911,770
08/25/1999	17:10:15	9,175.00	282.25	10.90	297.2	91,233,732	289.72	3.43	0.0	98,911,770
08/25/1999	17:15:15	9,180.00	282.98	10.17	297.2	91,235,218	289.72	3.43	0.0	98,911,770
08/25/1999	17:20:15	9,185.00	282.24	10.91	297.2	91,236,704	289.70	3.45	0.0	98,911,770
08/25/1999	17:25:15	9,190.00	282.56	10.59	297.2	91,238,190	289.70	3.45	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/25/1999	17:30:15	9,195.00	282.22	10.93	297.2	91,239,676	289.70	3.45	0.0	98,911,770
08/25/1999	17:35:15	9,200.00	282.10	11.05	297.2	91,241,162	289.70	3.45	0.0	98,911,770
08/25/1999	17:40:15	9,205.00	282.85	10.30	297.2	91,242,648	289.70	3.45	0.0	98,911,770
08/25/1999	17:45:15	9,210.00	282.70	10.45	297.2	91,244,134	289.69	3.47	0.0	98,911,770
08/25/1999	17:50:15	9,215.00	282.81	10.34	297.2	91,245,620	289.70	3.45	0.0	98,911,770
08/25/1999	17:55:15	9,220.00	282.95	10.21	297.2	91,247,106	289.69	3.47	0.0	98,911,770
08/25/1999	18:00:15	9,225.00	282.94	10.21	297.2	91,248,592	289.69	3.47	0.0	98,911,770
08/25/1999	18:05:15	9,230.00	282.46	10.69	297.2	91,250,078	289.69	3.47	0.0	98,911,770
08/25/1999	18:10:15	9,235.00	282.69	10.46	297.2	91,251,564	289.69	3.47	0.0	98,911,770
08/25/1999	18:15:15	9,240.00	281.98	11.18	297.2	91,253,050	289.69	3.47	0.0	98,911,770
08/25/1999	18:20:15	9,245.00	282.52	10.63	297.2	91,254,536	289.69	3.47	0.0	98,911,770
08/25/1999	18:25:15	9,250.00	282.86	10.29	297.2	91,256,022	289.69	3.47	0.0	98,911,770
08/25/1999	18:30:15	9,255.00	282.59	10.56	297.2	91,257,508	289.69	3.47	0.0	98,911,770
08/25/1999	18:35:15	9,260.00	282.43	10.72	297.2	91,258,994	289.67	3.48	0.0	98,911,770
08/25/1999	18:40:15	9,265.00	282.53	10.62	297.2	91,260,480	289.69	3.47	0.0	98,911,770
08/25/1999	18:45:15	9,270.00	282.32	10.84	297.2	91,261,966	289.67	3.48	0.0	98,911,770
08/25/1999	18:50:15	9,275.00	282.34	10.81	297.2	91,263,452	289.67	3.48	0.0	98,911,770
08/25/1999	18:55:15	9,280.00	282.61	10.55	297.2	91,264,938	289.67	3.48	0.0	98,911,770
08/25/1999	19:00:15	9,285.00	282.24	10.91	297.2	91,266,424	289.67	3.48	0.0	98,911,770
08/25/1999	19:05:15	9,290.00	282.09	11.06	297.2	91,267,910	289.67	3.48	0.0	98,911,770
08/25/1999	19:10:15	9,295.00	282.73	10.43	297.2	91,269,396	289.67	3.48	0.0	98,911,770
08/25/1999	19:15:15	9,300.00	282.18	10.98	297.2	91,270,882	289.67	3.48	0.0	98,911,770
08/25/1999	19:20:15	9,305.00	282.74	10.41	297.2	91,272,368	289.66	3.50	0.0	98,911,770
08/25/1999	19:25:15	9,310.00	282.62	10.54	297.2	91,273,854	289.66	3.50	0.0	98,911,770
08/25/1999	19:30:15	9,315.00	282.75	10.40	297.2	91,275,340	289.66	3.50	0.0	98,911,770
08/25/1999	19:35:15	9,320.00	282.48	10.67	297.2	91,276,826	289.66	3.50	0.0	98,911,770
08/25/1999	19:40:15	9,325.00	282.32	10.84	297.2	91,278,312	289.66	3.50	0.0	98,911,770
08/25/1999	19:45:15	9,330.00	282.22	10.93	297.2	91,279,798	289.66	3.50	0.0	98,911,770
08/25/1999	19:50:15	9,335.00	282.20	10.95	297.2	91,281,284	289.66	3.50	0.0	98,911,770
08/25/1999	19:55:15	9,340.00	282.31	10.84	297.2	91,282,770	289.64	3.51	0.0	98,911,770
08/25/1999	20:00:15	9,345.00	282.58	10.57	297.2	91,284,256	289.64	3.51	0.0	98,911,770
08/25/1999	20:05:15	9,350.00	282.62	10.54	297.2	91,285,742	289.64	3.51	0.0	98,911,770
08/25/1999	20:10:15	9,355.00	282.35	10.80	297.2	91,287,228	289.64	3.51	0.0	98,911,770
08/25/1999	20:15:15	9,360.00	282.36	10.79	297.2	91,288,714	289.64	3.51	0.0	98,911,770
08/25/1999	20:20:15	9,365.00	282.05	11.10	297.2	91,290,200	289.64	3.51	0.0	98,911,770
08/25/1999	20:25:15	9,370.00	282.76	10.40	297.2	91,291,686	289.64	3.51	0.0	98,911,770
08/25/1999	20:30:15	9,375.00	282.62	10.53	297.2	91,293,172	289.64	3.51	0.0	98,911,770
08/25/1999	20:35:15	9,380.00	282.19	10.96	297.2	91,294,658	289.63	3.53	0.0	98,911,770
08/25/1999	20:40:15	9,385.00	282.71	10.44	297.2	91,296,144	289.63	3.53	0.0	98,911,770
08/25/1999	20:45:15	9,390.00	282.08	11.07	297.2	91,297,630	289.63	3.53	0.0	98,911,770
08/25/1999	20:50:15	9,395.00	282.53	10.62	297.2	91,299,116	289.63	3.53	0.0	98,911,770
08/25/1999	20:55:15	9,400.00	282.32	10.84	297.2	91,300,602	289.63	3.53	0.0	98,911,770
08/25/1999	21:00:15	9,405.00	281.87	11.28	297.2	91,302,088	289.63	3.53	0.0	98,911,770
08/25/1999	21:05:15	9,410.00	282.39	10.76	297.2	91,303,574	289.63	3.53	0.0	98,911,770
08/25/1999	21:10:15	9,415.00	281.96	11.19	297.2	91,305,060	289.61	3.54	0.0	98,911,770
08/25/1999	21:15:15	9,420.00	282.30	10.85	297.2	91,306,546	289.61	3.54	0.0	98,911,770
08/25/1999	21:20:15	9,425.00	282.76	10.40	297.2	91,308,032	289.61	3.54	0.0	98,911,770
08/25/1999	21:25:15	9,430.00	282.43	10.73	297.2	91,309,518	289.61	3.54	0.0	98,911,770
08/25/1999	21:30:15	9,435.00	282.42	10.73	297.2	91,311,004	289.61	3.54	0.0	98,911,770
08/25/1999	21:35:15	9,440.00	282.32	10.84	297.2	91,312,490	289.61	3.54	0.0	98,911,770
08/25/1999	21:40:15	9,445.00	282.84	10.32	297.2	91,313,976	289.61	3.54	0.0	98,911,770
08/25/1999	21:45:15	9,450.00	282.21	10.94	297.2	91,315,462	289.61	3.54	0.0	98,911,770
08/25/1999	21:50:15	9,455.00	282.10	11.06	297.2	91,316,948	289.61	3.54	0.0	98,911,770
08/25/1999	21:55:15	9,460.00	282.41	10.74	297.2	91,318,434	289.61	3.54	0.0	98,911,770
08/25/1999	22:00:15	9,465.00	282.54	10.61	297.2	91,319,920	289.61	3.54	0.0	98,911,770
08/25/1999	22:05:15	9,470.00	282.54	10.61	297.2	91,321,406	289.59	3.56	0.0	98,911,770
08/25/1999	22:10:15	9,475.00	282.22	10.93	297.2	91,322,892	289.59	3.56	0.0	98,911,770
08/25/1999	22:15:15	9,480.00	282.13	11.03	297.2	91,324,378	289.59	3.56	0.0	98,911,770
08/25/1999	22:20:15	9,485.00	282.12	11.03	297.2	91,325,864	289.59	3.56	0.0	98,911,770
08/25/1999	22:25:15	9,490.00	282.44	10.71	297.2	91,327,350	289.59	3.56	0.0	98,911,770
08/25/1999	22:30:15	9,495.00	282.43	10.73	297.2	91,328,836	289.59	3.56	0.0	98,911,770
08/25/1999	22:35:15	9,500.00	282.46	10.69	297.2	91,330,322	289.59	3.56	0.0	98,911,770
08/25/1999	22:40:15	9,505.00	282.62	10.54	297.2	91,331,808	289.58	3.57	0.0	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #1 & Well #2
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/25/1999	22:45:15	9,510.00	282.37	10.78	297.2	91,333,294	289.58	3.57	0.0	98,911,770
08/25/1999	22:50:15	9,515.00	281.99	11.16	297.2	91,334,780	289.58	3.57	0.0	98,911,770
08/25/1999	22:55:15	9,520.00	281.87	11.28	297.2	91,336,266	289.58	3.57	0.0	98,911,770
08/25/1999	23:00:15	9,525.00	282.01	11.14	297.2	91,337,752	289.58	3.57	0.0	98,911,770
08/25/1999	23:05:15	9,530.00	282.72	10.43	297.2	91,339,238	289.58	3.57	0.0	98,911,770
08/25/1999	23:10:15	9,535.00	282.09	11.06	297.2	91,340,724	289.58	3.57	0.0	98,911,770
08/25/1999	23:15:15	9,540.00	282.30	10.85	297.2	91,342,210	289.58	3.57	0.0	98,911,770
08/25/1999	23:20:15	9,545.00	282.00	11.15	297.2	91,343,696	289.56	3.59	0.0	98,911,770
08/25/1999	23:25:15	9,550.00	281.95	11.20	297.2	91,345,182	289.56	3.59	0.0	98,911,770
08/25/1999	23:30:15	9,555.00	282.19	10.96	297.2	91,346,668	289.58	3.57	0.0	98,911,770
08/25/1999	23:35:15	9,560.00	282.49	10.66	297.2	91,348,154	289.56	3.59	0.0	98,911,770
08/25/1999	23:40:15	9,565.00	282.78	10.37	297.2	91,349,640	289.56	3.59	0.0	98,911,770
08/25/1999	23:45:15	9,570.00	282.39	10.76	297.2	91,351,126	289.56	3.59	0.0	98,911,770
08/25/1999	23:50:15	9,575.00	282.14	11.01	297.2	91,352,612	289.56	3.59	0.0	98,911,770
08/25/1999	23:55:15	9,580.00	282.56	10.59	297.2	91,354,098	289.56	3.59	0.0	98,911,770
08/26/1999	0:00:15	9,585.00	282.64	10.51	297.2	91,355,584	289.56	3.59	0.0	98,911,770
08/26/1999	0:05:15	9,590.00	282.36	10.79	297.2	91,357,070	289.56	3.59	0.0	98,911,770
08/26/1999	0:10:15	9,595.00	281.91	11.24	297.2	91,358,556	289.55	3.61	0.0	98,911,770
08/26/1999	0:15:15	9,600.00	282.55	10.60	297.2	91,360,042	289.55	3.61	0.0	98,911,770
08/26/1999	0:20:15	9,605.00	282.53	10.62	297.2	91,361,528	289.55	3.61	0.0	98,911,770
08/26/1999	0:25:15	9,610.00	282.51	10.65	297.2	91,363,014	289.55	3.61	0.0	98,911,770
08/26/1999	0:30:15	9,615.00	281.93	11.22	297.2	91,364,500	289.55	3.61	0.0	98,911,770
08/26/1999	0:35:15	9,620.00	282.24	10.91	297.2	91,365,986	289.55	3.61	0.0	98,911,770
08/26/1999	0:40:15	9,625.00	281.87	11.28	297.2	91,367,472	289.55	3.61	0.0	98,911,770
08/26/1999	0:45:15	9,630.00	282.18	10.97	297.2	91,368,958	289.55	3.61	0.0	98,911,770
08/26/1999	0:50:15	9,635.00	282.05	11.10	297.2	91,370,444	289.53	3.62	0.0	98,911,770
08/26/1999	0:55:15	9,640.00	281.98	11.18	297.2	91,371,930	289.55	3.61	0.0	98,911,770
08/26/1999	1:00:15	9,645.00	282.07	11.08	297.2	91,373,416	289.55	3.61	0.0	98,911,770
08/26/1999	1:05:15	9,650.00	282.26	10.89	297.2	91,374,902	289.53	3.62	0.0	98,911,770
08/26/1999	1:10:15	9,655.00	281.90	11.25	297.2	91,376,388	289.53	3.62	0.0	98,911,770
08/26/1999	1:15:15	9,660.00	282.01	11.14	297.2	91,377,874	289.53	3.62	0.0	98,911,770
08/26/1999	1:20:15	9,665.00	282.31	10.84	297.2	91,379,360	289.53	3.62	0.0	98,911,770
08/26/1999	1:25:15	9,670.00	282.30	10.85	297.2	91,380,846	289.52	3.64	0.0	98,911,770
08/26/1999	1:30:15	9,675.00	282.03	11.12	297.2	91,382,332	289.53	3.62	0.0	98,911,770
08/26/1999	1:35:15	9,680.00	281.72	11.43	297.2	91,383,818	289.53	3.62	0.0	98,911,770
08/26/1999	1:40:15	9,685.00	282.12	11.03	297.2	91,385,304	289.53	3.62	0.0	98,911,770
08/26/1999	1:45:15	9,690.00	281.92	11.23	297.2	91,386,790	289.52	3.64	0.0	98,911,770
08/26/1999	1:50:15	9,695.00	282.54	10.61	297.2	91,388,276	289.52	3.64	0.0	98,911,770
08/26/1999	1:55:15	9,700.00	282.57	10.58	297.2	91,389,762	289.52	3.64	0.0	98,911,770
08/26/1999	2:00:15	9,705.00	281.80	11.36	297.2	91,391,248	289.52	3.64	0.0	98,911,770
08/26/1999	2:05:15	9,710.00	281.69	11.46	297.2	91,392,734	289.50	3.65	0.0	98,911,770
08/26/1999	2:10:15	9,715.00	282.27	10.88	297.2	91,394,220	289.52	3.64	0.0	98,911,770
08/26/1999	2:15:15	9,720.00	281.98	11.18	297.2	91,395,706	289.52	3.64	0.0	98,911,770
08/26/1999	2:20:15	9,725.00	281.89	11.26	297.2	91,397,192	289.50	3.65	0.0	98,911,770
08/26/1999	2:25:15	9,730.00	281.99	11.16	297.2	91,398,678	289.50	3.65	0.0	98,911,770
08/26/1999	2:30:15	9,735.00	281.95	11.20	297.2	91,400,164	289.50	3.65	0.0	98,911,770
08/26/1999	2:35:15	9,740.00	282.18	10.98	297.2	91,401,650	289.50	3.65	0.0	98,911,770
08/26/1999	2:40:15	9,745.00	281.80	11.36	297.2	91,403,136	289.50	3.65	0.0	98,911,770
08/26/1999	2:45:15	9,750.00	282.36	10.80	297.2	91,404,622	289.50	3.65	0.0	98,911,770
08/26/1999	2:50:15	9,755.00	281.91	11.24	297.2	91,406,108	289.49	3.67	0.0	98,911,770
08/26/1999	2:55:15	9,760.00	282.09	11.06	297.2	91,407,594	289.50	3.65	0.0	98,911,770
08/26/1999	3:00:15	9,765.00	281.72	11.43	297.2	91,409,080	289.49	3.67	0.0	98,911,770
08/26/1999	3:05:15	9,770.00	282.14	11.02	297.2	91,410,566	289.49	3.67	0.0	98,911,770
08/26/1999	3:10:15	9,775.00	281.73	11.43	297.2	91,412,052	289.49	3.67	0.0	98,911,770
08/26/1999	3:15:15	9,780.00	281.89	11.26	297.2	91,413,538	289.49	3.67	0.0	98,911,770
08/26/1999	3:20:15	9,785.00	281.73	11.42	297.2	91,415,024	289.49	3.67	0.0	98,911,770
08/26/1999	3:25:15	9,790.00	282.01	11.14	297.2	91,416,510	289.47	3.68	0.0	98,911,770
08/26/1999	3:30:15	9,795.00	282.69	10.46	297.2	91,417,996	289.47	3.68	0.0	98,911,770
08/26/1999	3:35:15	9,800.00	281.95	11.20	297.2	91,419,482	289.47	3.68	0.0	98,911,770
08/26/1999	3:40:15	9,805.00	282.37	10.78	297.2	91,420,968	289.47	3.68	0.0	98,911,770
08/26/1999	3:45:15	9,810.00	282.42	10.73	297.2	91,422,454	289.47	3.68	0.0	98,911,770
08/26/1999	3:50:15	9,815.00	282.21	10.94	297.2	91,423,940	289.47	3.68	0.0	98,911,770
08/26/1999	3:55:15	9,820.00	282.43	10.73	297.2	91,425,426	289.47	3.68	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #1 & Well #2
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/26/1999	4:00:15	9,825.00	281.74	11.41	297.2	91,426,912	289.47	3.68	0.0	98,911,770
08/26/1999	4:05:15	9,830.00	282.22	10.93	297.2	91,428,398	289.47	3.68	0.0	98,911,770
08/26/1999	4:10:15	9,835.00	282.07	11.08	297.2	91,429,884	289.47	3.68	0.0	98,911,770
08/26/1999	4:15:15	9,840.00	282.64	10.51	297.2	91,431,370	289.47	3.68	0.0	98,911,770
08/26/1999	4:20:15	9,845.00	281.82	11.33	297.2	91,432,856	289.45	3.70	0.0	98,911,770
08/26/1999	4:25:15	9,850.00	282.50	10.65	297.2	91,434,342	289.47	3.68	0.0	98,911,770
08/26/1999	4:30:15	9,855.00	281.72	11.43	297.2	91,435,828	289.45	3.70	0.0	98,911,770
08/26/1999	4:35:15	9,860.00	282.21	10.95	297.2	91,437,314	289.45	3.70	0.0	98,911,770
08/26/1999	4:40:15	9,865.00	282.33	10.82	297.2	91,438,800	289.45	3.70	0.0	98,911,770
08/26/1999	4:45:15	9,870.00	282.39	10.76	297.2	91,440,286	289.45	3.70	0.0	98,911,770
08/26/1999	4:50:15	9,875.00	281.88	11.27	297.2	91,441,772	289.45	3.70	0.0	98,911,770
08/26/1999	4:55:15	9,880.00	281.94	11.21	297.2	91,443,258	289.45	3.70	0.0	98,911,770
08/26/1999	5:00:15	9,885.00	282.45	10.70	297.2	91,444,744	289.45	3.70	0.0	98,911,770
08/26/1999	5:05:15	9,890.00	282.34	10.81	297.2	91,446,230	289.45	3.70	0.0	98,911,770
08/26/1999	5:10:15	9,895.00	281.91	11.24	297.2	91,447,716	289.44	3.72	0.0	98,911,770
08/26/1999	5:15:15	9,900.00	281.67	11.48	297.2	91,449,202	289.44	3.72	0.0	98,911,770
08/26/1999	5:20:15	9,905.00	281.56	11.59	297.2	91,450,688	289.44	3.72	0.0	98,911,770
08/26/1999	5:25:15	9,910.00	282.18	10.97	297.2	91,452,174	289.44	3.72	0.0	98,911,770
08/26/1999	5:30:15	9,915.00	282.41	10.74	297.2	91,453,660	289.44	3.72	0.0	98,911,770
08/26/1999	5:35:15	9,920.00	282.68	10.47	297.2	91,455,146	289.44	3.72	0.0	98,911,770
08/26/1999	5:40:15	9,925.00	282.40	10.75	297.2	91,456,632	289.44	3.72	0.0	98,911,770
08/26/1999	5:45:15	9,930.00	281.86	11.29	297.2	91,458,118	289.44	3.72	0.0	98,911,770
08/26/1999	5:50:15	9,935.00	282.24	10.91	297.2	91,459,604	289.42	3.73	0.0	98,911,770
08/26/1999	5:55:15	9,940.00	282.22	10.93	297.2	91,461,090	289.42	3.73	0.0	98,911,770
08/26/1999	6:00:15	9,945.00	282.66	10.49	297.2	91,462,576	289.42	3.73	0.0	98,911,770
08/26/1999	6:05:15	9,950.00	282.23	10.92	297.2	91,464,062	289.42	3.73	0.0	98,911,770
08/26/1999	6:10:15	9,955.00	282.44	10.71	297.2	91,465,548	289.42	3.73	0.0	98,911,770
08/26/1999	6:15:15	9,960.00	282.32	10.84	297.2	91,467,034	289.42	3.73	0.0	98,911,770
08/26/1999	6:20:15	9,965.00	281.69	11.46	297.2	91,468,520	289.42	3.73	0.0	98,911,770
08/26/1999	6:25:15	9,970.00	281.55	11.60	297.2	91,470,006	289.42	3.73	0.0	98,911,770
08/26/1999	6:30:15	9,975.00	282.02	11.14	297.2	91,471,492	289.40	3.75	0.0	98,911,770
08/26/1999	6:35:15	9,980.00	281.79	11.36	297.2	91,472,978	289.40	3.75	0.0	98,911,770
08/26/1999	6:40:15	9,985.00	281.71	11.44	297.2	91,474,464	289.40	3.75	0.0	98,911,770
08/26/1999	7:40:15	10,045.00	281.42	11.73	297.2	91,492,296	289.39	3.76	0.0	98,911,770
08/26/1999	8:40:15	10,105.00	282.33	10.83	297.2	91,510,128	289.36	3.80	0.0	98,911,770
08/26/1999	9:40:15	10,165.00	282.62	10.54	297.2	91,527,960	289.34	3.81	0.0	98,911,770
08/26/1999	10:40:15	10,225.00	281.65	11.50	297.2	91,545,792	289.30	3.86	0.0	98,911,770
08/26/1999	11:40:15	10,285.00	281.91	11.24	297.2	91,563,624	289.28	3.87	0.0	98,911,770
08/26/1999	12:40:15	10,345.00	281.68	11.47	297.2	91,581,456	289.26	3.89	0.0	98,911,770
08/26/1999	13:40:15	10,405.00	282.36	10.80	297.2	91,599,288	289.25	3.91	0.0	98,911,770
08/26/1999	14:40:15	10,465.00	282.42	10.73	297.2	91,617,120	289.23	3.92	0.0	98,911,770
08/26/1999	15:40:15	10,525.00	281.79	11.36	294.5	91,634,789	289.22	3.94	0.0	98,911,770
08/26/1999	16:40:15	10,585.00	282.49	10.66	294.5	91,652,458	289.19	3.97	0.0	98,911,770
08/26/1999	17:40:15	10,645.00	281.49	11.66	294.5	91,670,126	289.19	3.97	0.0	98,911,770
08/26/1999	18:40:15	10,705.00	282.56	10.59	294.5	91,687,795	289.15	4.00	0.0	98,911,770
08/26/1999	19:40:15	10,765.00	282.61	10.55	294.5	91,705,464	289.14	4.02	0.0	98,911,770
08/26/1999	20:40:15	10,825.00	282.09	11.06	294.5	91,723,133	289.11	4.05	0.0	98,911,770
08/26/1999	21:40:15	10,885.00	281.51	11.64	294.5	91,740,802	289.11	4.05	0.0	98,911,770
08/26/1999	22:40:15	10,945.00	282.57	10.58	294.5	91,758,470	289.07	4.08	0.0	98,911,770
08/26/1999	23:40:15	11,005.00	282.29	10.86	294.5	91,776,139	289.07	4.08	0.0	98,911,770
08/27/1999	0:40:15	11,065.00	282.24	10.91	294.5	91,793,808	289.04	4.11	0.0	98,911,770
08/27/1999	1:40:15	11,125.00	282.02	11.14	294.5	91,811,477	289.03	4.12	0.0	98,911,770
08/27/1999	2:40:15	11,185.00	282.14	11.01	294.5	91,829,146	289.01	4.14	0.0	98,911,770
08/27/1999	3:40:15	11,245.00	281.55	11.60	294.5	91,846,814	289.00	4.16	0.0	98,911,770
08/27/1999	4:40:15	11,305.00	282.46	10.69	294.5	91,864,483	288.98	4.17	0.0	98,911,770
08/27/1999	5:40:15	11,365.00	282.03	11.13	294.5	91,882,152	288.96	4.19	0.0	98,911,770
08/27/1999	6:40:15	11,425.00	281.70	11.45	294.5	91,899,821	288.93	4.22	0.0	98,911,770
08/27/1999	7:40:15	11,485.00	281.88	11.28	294.5	91,917,490	288.92	4.24	0.0	98,911,770
08/27/1999	8:40:15	11,545.00	281.69	11.47	294.5	91,935,158	288.89	4.27	0.0	98,911,770
08/27/1999	9:40:15	11,605.00	282.10	11.06	294.5	91,952,827	288.89	4.27	0.0	98,911,770
08/27/1999	10:40:15	11,665.00	281.38	11.77	294.5	91,970,496	288.86	4.30	0.0	98,911,770
08/27/1999	11:40:15	11,725.00	281.43	11.73	293.6	91,988,110	288.84	4.31	0.0	98,911,770
08/27/1999	12:40:15	11,785.00	282.27	10.88	293.6	92,005,724	288.84	4.31	0.0	98,911,770

YIELD TEST LOG

Name of Owner:	**University of Connecticut**
Address of Owner:	**39 LeDoyt Road, Box U-38**
	Storrs, CT 06269-3038
Source Designation:	**Willimantic River Wellfield**
	Well #1 & Well #2
Person Conducting Test:	**Christopher Till, P.E.**
Firm:	**Lenard Engineering, Inc.**
Address of Firm:	**1066 Storrs Road, P.O. Box 580, Storrs, CT 06268**

			WELL 1				WELL 2			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/27/1999	13:40:15	11,845.00	282.12	11.03	293.6	92,023,339	288.82	4.33	0.0	98,911,770
08/27/1999	14:40:15	11,905.00	281.83	11.32	293.6	92,040,953	288.81	4.35	0.0	98,911,770
08/27/1999	15:40:15	11,965.00	282.01	11.14	293.6	92,058,567	288.79	4.36	0.0	98,911,770
08/27/1999	16:40:15	12,025.00	282.09	11.06	293.6	92,076,181	288.77	4.38	0.0	98,911,770
08/27/1999	17:40:15	12,085.00	282.03	11.12	293.6	92,093,796	288.76	4.39	0.0	98,911,770
08/27/1999	18:40:15	12,145.00	281.20	11.95	293.6	92,111,410	288.74	4.41	0.0	98,911,770
08/27/1999	19:40:15	12,205.00	281.40	11.75	293.6	92,129,024	288.73	4.42	0.0	98,911,770
08/27/1999	20:40:15	12,265.00	281.99	11.16	293.6	92,146,638	288.71	4.44	0.0	98,911,770
08/27/1999	21:40:15	12,325.00	281.99	11.16	293.6	92,164,253	288.70	4.46	0.0	98,911,770
08/27/1999	22:40:15	12,385.00	281.94	11.21	293.6	92,181,867	288.68	4.47	0.0	98,911,770
08/27/1999	23:40:15	12,445.00	282.00	11.15	293.6	92,199,481	288.68	4.47	0.0	98,911,770
08/28/1999	0:40:15	12,505.00	282.03	11.12	293.6	92,217,095	288.67	4.49	0.0	98,911,770
08/28/1999	1:40:15	12,565.00	281.72	11.43	293.6	92,234,710	288.65	4.50	0.0	98,911,770
08/28/1999	2:40:15	12,625.00	281.21	11.94	293.6	92,252,324	288.63	4.52	0.0	98,911,770
08/28/1999	3:40:15	12,685.00	281.55	11.61	293.6	92,269,938	288.62	4.54	0.0	98,911,770
08/28/1999	4:40:15	12,745.00	281.80	11.36	293.6	92,287,552	288.60	4.55	0.0	98,911,770
08/28/1999	5:40:15	12,805.00	281.74	11.41	293.6	92,305,167	288.59	4.57	0.0	98,911,770
08/28/1999	6:40:15	12,865.00	282.03	11.12	293.6	92,322,781	288.57	4.58	0.0	98,911,770
08/28/1999	7:40:15	12,925.00	281.54	11.62	293.6	92,340,395	288.56	4.60	0.0	98,911,770
08/28/1999	8:40:15	12,985.00	281.29	11.86	293.6	92,358,009	288.56	4.60	0.0	98,911,770
08/28/1999	9:40:15	13,045.00	281.53	11.62	293.6	92,375,624	288.54	4.61	0.0	98,911,770
08/28/1999	10:40:15	13,105.00	281.69	11.46	293.6	92,393,238	288.51	4.65	0.0	98,911,770
08/28/1999	11:40:15	13,165.00	281.21	11.95	293.6	92,410,852	288.51	4.65	0.0	98,911,770
08/28/1999	12:40:15	13,225.00	281.06	12.10	293.6	92,428,466	0.00	293.15	0.0	98,911,770
08/28/1999	13:40:15	13,285.00	281.43	11.72	293.6	92,446,080	0.00	293.15	0.0	98,911,770

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/13/1999	10:00	-8,535	296.57	11.68			286.75	1.46	0.00	18,055
08/13/1999	11:00	-8,475	297.19	11.06			286.76	1.45	0.00	18,055
08/13/1999	12:00	-8,415	297.68	10.57			286.76	1.45	0.00	18,055
08/13/1999	13:00	-8,355	297.33	10.91			286.75	1.46	0.00	18,055
08/13/1999	14:00	-8,295	297.67	10.58			286.75	1.46	0.00	18,055
08/13/1999	15:00	-8,235	297.58	10.67			286.75	1.46	0.00	18,055
08/13/1999	16:00	-8,175	297.44	10.81			286.74	1.47	0.00	18,055
08/13/1999	17:00	-8,115	297.29	10.96			286.78	1.43	0.00	18,055
08/13/1999	18:00	-8,055	297.51	10.74			286.77	1.44	0.00	18,055
08/13/1999	19:00	-7,995	297.32	10.93			286.77	1.44	0.00	18,055
08/13/1999	20:00	-7,935	297.78	10.47			286.74	1.47	0.00	18,055
08/13/1999	21:00	-7,875	297.84	10.41			286.80	1.41	0.00	18,055
08/13/1999	22:00	-7,815	297.45	10.80			286.84	1.37	0.00	18,055
08/13/1999	23:00	-7,755	297.46	10.78			286.83	1.38	0.00	18,055
08/14/1999	0:00	-7,695	297.48	10.77			286.84	1.37	0.00	18,055
08/14/1999	1:00	-7,635	297.38	10.87			286.85	1.36	0.00	18,055
08/14/1999	2:00	-7,575	297.44	10.81			286.85	1.37	0.00	18,055
08/14/1999	3:00	-7,515	297.35	10.90			286.83	1.38	0.00	18,055
08/14/1999	4:00	-7,455	297.52	10.73			286.86	1.35	0.00	18,055
08/14/1999	5:00	-7,395	297.64	10.61			286.88	1.33	0.00	18,055
08/14/1999	6:00	-7,335	297.78	10.47			286.94	1.27	0.00	18,055
08/14/1999	7:00	-7,275	297.45	10.80			286.93	1.28	0.00	18,055
08/14/1999	8:00	-7,215	297.87	10.38			287.01	1.20	0.00	18,055
08/14/1999	9:00	-7,155	296.83	11.42			287.03	1.18	0.00	18,055
08/14/1999	10:00	-7,095	296.83	11.42			287.05	1.16	0.00	18,055
08/14/1999	11:00	-7,035	297.08	11.17			287.09	1.12	0.00	18,055
08/14/1999	12:00	-6,975	296.79	11.46			287.11	1.10	0.00	18,055
08/14/1999	13:00	-6,915	297.16	11.09			287.12	1.09	0.00	18,055
08/14/1999	14:00	-6,855	297.38	10.87			287.11	1.10	0.00	18,055
08/14/1999	15:00	-6,795	297.74	10.51			287.10	1.11	0.00	18,055
08/14/1999	16:00	-6,735	298.04	10.21			287.10	1.11	0.00	18,055
08/14/1999	17:00	-6,675	298.11	10.14			287.13	1.08	0.00	18,055
08/14/1999	18:00	-6,615	298.10	10.15			287.16	1.05	0.00	18,055
08/14/1999	19:00	-6,555	298.16	10.09			287.21	1.00	0.00	18,055
08/14/1999	20:00	-6,495	298.06	10.19			287.22	0.99	0.00	18,055
08/14/1999	21:00	-6,435	298.21	10.03			287.31	0.90	0.00	18,055
08/14/1999	22:00	-6,375	297.84	10.41			287.34	0.87	0.00	18,055
08/14/1999	23:00	-6,315	297.85	10.40			287.36	0.85	0.00	18,055
08/15/1999	0:00	-6,255	297.88	10.37			287.37	0.84	0.00	18,055
08/15/1999	1:00	-6,195	297.88	10.37			287.36	0.85	0.00	18,055
08/15/1999	2:00	-6,135	298.24	10.01			287.44	0.77	0.00	18,055
08/15/1999	3:00	-6,075	297.98	10.27			287.47	0.74	0.00	18,055
08/15/1999	4:00	-6,015	298.00	10.25			287.42	0.79	0.00	18,055
08/15/1999	5:00	-5,955	298.34	9.90			287.46	0.75	0.00	18,055
08/15/1999	6:00	-5,895	298.03	10.22			287.50	0.71	0.00	18,055
08/15/1999	7:00	-5,835	298.21	10.03			287.55	0.66	0.00	18,055
08/15/1999	8:00	-5,775	298.08	10.16			287.61	0.60	0.00	18,055
08/15/1999	9:00	-5,715	297.98	10.27			287.66	0.55	0.00	18,055
08/15/1999	10:00	-5,655	297.72	10.53			287.72	0.49	0.00	18,055
08/15/1999	11:00	-5,595	297.55	10.70			287.75	0.46	0.00	18,055
08/15/1999	12:00	-5,535	297.97	10.28			287.75	0.46	0.00	18,055
08/15/1999	13:00	-5,475	297.91	10.34			287.71	0.50	0.00	18,055
08/15/1999	14:00	-5,415	297.44	10.81			287.75	0.46	0.00	18,055
08/15/1999	15:00	-5,355	298.43	9.82			287.77	0.44	0.00	18,055
08/15/1999	16:00	-5,295	298.27	9.98			287.79	0.42	0.00	18,055
08/15/1999	17:00	-5,235	298.39	9.86			287.82	0.39	0.00	18,055
08/15/1999	18:00	-5,175	298.52	9.73			287.84	0.37	0.00	18,055
08/15/1999	19:00	-5,115	298.55	9.70			287.87	0.34	0.00	18,055
08/15/1999	20:00	-5,055	298.33	9.92			287.94	0.27	0.00	18,055

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/15/1999	21:00	-4,995	298.33	9.92			287.99	0.22	0.00	18,055
08/15/1999	22:00	-4,935	298.42	9.83			288.01	0.20	0.00	18,055
08/15/1999	23:00	-4,875	298.68	9.57			288.01	0.20	0.00	18,055
08/16/1999	0:00	-4,815	298.69	9.56			288.05	0.16	0.00	18,055
08/16/1999	1:00	-4,755	298.47	9.77			288.08	0.13	0.00	18,055
08/16/1999	2:00	-4,695	298.59	9.66			288.05	0.16	0.00	18,055
08/16/1999	3:00	-4,635	298.65	9.60			288.07	0.14	0.00	18,055
08/16/1999	4:00	-4,575	298.47	9.77			288.10	0.11	0.00	18,055
08/16/1999	5:00	-4,515	298.81	9.44			288.16	0.05	0.00	18,055
08/16/1999	6:00	-4,455	298.53	9.72			288.18	0.03	0.00	18,055
08/16/1999	7:00	-4,395	298.59	9.66			288.22	-0.01	0.00	18,055
08/16/1999	8:00	-4,335	298.79	9.46			288.24	-0.03	0.00	18,055
08/16/1999	9:00	-4,275	298.36	9.89			288.26	-0.05	0.00	18,055
08/16/1999	10:00	-4,215	297.91	10.34			288.23	-0.02	0.00	18,055
08/16/1999	11:00	-4,155	297.85	10.40			288.26	-0.05	0.00	18,055
08/16/1999	12:00	-4,095	298.30	9.95			288.27	-0.06	0.00	18,055
08/16/1999	13:00	-4,035	298.26	9.99			288.24	-0.03	0.00	18,055
08/16/1999	14:00	-3,975	297.93	10.32			288.22	-0.01	0.00	18,055
08/16/1999	15:00	-3,915	298.46	9.79			288.22	-0.01	0.00	18,055
08/16/1999	16:00	-3,855	298.49	9.76			288.20	0.01	0.00	18,055
08/16/1999	17:00	-3,795	298.16	10.09			288.20	0.01	0.00	18,055
08/16/1999	18:00	-3,735	298.36	9.89			288.19	0.02	0.00	18,055
08/16/1999	19:00	-3,675	298.08	10.16			288.22	-0.01	0.00	18,055
08/16/1999	20:00	-3,615	298.93	9.31			288.27	-0.06	0.00	18,055
08/16/1999	21:00	-3,555	299.04	9.21			288.29	-0.08	0.00	18,055
08/16/1999	22:00	-3,495	298.81	9.44			288.29	-0.08	0.00	18,055
08/16/1999	23:00	-3,435	298.99	9.26			288.28	-0.07	0.00	18,055
08/17/1999	0:00	-3,375	298.83	9.42			288.27	-0.06	0.00	18,055
08/17/1999	1:00	-3,315	298.79	9.46			288.26	-0.05	0.00	18,055
08/17/1999	2:00	-3,255	298.99	9.26			288.25	-0.04	0.00	18,055
08/17/1999	3:00	-3,195	298.88	9.37			288.27	-0.06	0.00	18,055
08/17/1999	4:00	-3,135	299.01	9.24			288.27	-0.06	0.00	18,055
08/17/1999	5:00	-3,075	299.21	9.04			288.28	-0.07	0.00	18,055
08/17/1999	6:00	-3,015	299.21	9.04			288.31	-0.10	0.00	18,055
08/17/1999	7:00	-2,955	299.15	9.10			288.30	-0.09	0.00	18,055
08/17/1999	8:00	-2,895	305.09	3.16			288.30	-0.09	0.00	18,055
08/17/1999	9:00	-2,835	305.32	2.93	0.0	28,269,132	288.48	-0.27	0.00	18,055
08/17/1999	10:00	-2,775	305.45	2.80	0.0	28,269,132	288.59	-0.38	0.00	18,055
08/17/1999	11:00	-2,715	305.64	2.61	0.0	28,269,132	288.69	-0.48	0.00	18,055
08/17/1999	12:00	-2,655	305.77	2.48	0.0	28,269,132	288.75	-0.54	0.00	18,055
08/17/1999	13:00	-2,595	305.90	2.35	0.0	28,269,132	288.66	-0.45	0.00	18,055
08/17/1999	14:00	-2,535	305.98	2.26	0.0	28,269,132	288.71	-0.50	0.00	18,055
08/17/1999	15:00	-2,475	306.09	2.16	0.0	28,269,132	288.59	-0.38	0.00	18,055
08/17/1999	16:00	-2,415	306.17	2.08	0.0	28,269,132	288.63	-0.42	0.00	18,055
08/17/1999	17:00	-2,355	306.26	1.99	0.0	28,269,132	288.75	-0.54	0.00	18,055
08/17/1999	18:00	-2,295	306.36	1.89	0.0	28,269,132	289.44	-1.23	0.00	18,055
08/17/1999	19:00	-2,235	306.42	1.83	0.0	28,269,132	289.13	-0.92	0.00	18,055
08/17/1999	20:00	-2,175	306.50	1.75	0.0	28,269,132	289.01	-0.80	0.00	18,055
08/17/1999	21:00	-2,115	306.59	1.66	0.0	28,269,132	288.94	-0.73	0.00	18,055
08/17/1999	22:00	-2,055	306.65	1.60	0.0	28,269,132	288.90	-0.69	0.00	18,055
08/17/1999	23:00	-1,995	306.73	1.51	0.0	28,269,132	288.88	-0.67	0.00	18,055
08/18/1999	0:00	-1,935	306.79	1.46	0.0	28,269,132	288.88	-0.67	0.00	18,055
08/18/1999	1:00	-1,875	306.88	1.37	0.0	28,269,132	288.89	-0.68	0.00	18,055
08/18/1999	2:00	-1,815	306.94	1.31	0.0	28,269,132	288.93	-0.72	0.00	18,055
08/18/1999	3:00	-1,755	306.99	1.26	0.0	28,269,132	288.95	-0.74	0.00	18,055
08/18/1999	4:00	-1,695	307.04	1.21	0.0	28,269,132	289.00	-0.79	0.00	18,055
08/18/1999	5:00	-1,635	307.11	1.14	0.0	28,269,132	289.05	-0.84	0.00	18,055
08/18/1999	6:00	-1,575	307.15	1.10	0.0	28,269,132	289.10	-0.89	0.00	18,055
08/18/1999	7:00	-1,515	307.22	1.02	0.0	28,269,132	289.14	-0.93	0.00	18,055

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #3 & Well #4
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/18/1999	8:00	-1,455	307.28	0.97	0.0	28,269,132	289.16	-0.95	0.00	18,055
08/18/1999	9:00	-1,395	307.33	0.92	0.0	28,269,132	289.21	-1.00	0.00	18,055
08/18/1999	10:00	-1,335	307.37	0.88	0.0	28,269,132	289.25	-1.03	0.00	18,055
08/18/1999	11:00	-1,275	307.40	0.85	0.0	28,269,132	289.27	-1.06	0.00	18,055
08/18/1999	12:00	-1,215	307.46	0.79	0.0	28,269,132	289.29	-1.08	0.00	18,055
08/18/1999	13:00	-1,155	307.50	0.75	0.0	28,269,132	289.29	-1.07	0.00	18,055
08/18/1999	14:00	-1,095	307.56	0.69	0.0	28,269,132	289.33	-1.12	0.00	18,055
08/18/1999	15:00	-1,035	307.58	0.66	0.0	28,269,132	289.35	-1.14	0.00	18,055
08/18/1999	16:00	-975	307.64	0.61	0.0	28,269,132	289.38	-1.17	0.00	18,055
08/18/1999	17:00	-915	307.66	0.59	0.0	28,269,132	289.43	-1.22	0.00	18,055
08/18/1999	18:00	-855	307.71	0.53	0.0	28,269,132	289.50	-1.29	0.00	18,055
08/18/1999	19:00	-795	307.77	0.48	0.0	28,269,132	289.58	-1.37	0.00	18,055
08/18/1999	20:00	-735	307.80	0.45	0.0	28,269,132	289.63	-1.42	0.00	18,055
08/18/1999	21:00	-675	307.83	0.42	0.0	28,269,132	289.68	-1.47	0.00	18,055
08/18/1999	22:00	-615	307.87	0.38	0.0	28,269,132	289.72	-1.51	0.00	18,055
08/18/1999	23:00	-555	307.92	0.33	0.0	28,269,132	289.76	-1.55	0.00	18,055
08/19/1999	0:00	-495	307.95	0.30	0.0	28,269,132	289.81	-1.60	0.00	18,055
08/19/1999	1:00	-435	307.97	0.27	0.0	28,269,132	289.85	-1.64	0.00	18,055
08/19/1999	2:00	-375	308.00	0.25	0.0	28,269,132	289.88	-1.67	0.00	18,055
08/19/1999	3:00	-315	308.05	0.20	0.0	28,269,132	289.90	-1.69	0.00	18,055
08/19/1999	4:00	-255	308.06	0.19	0.0	28,269,132	289.96	-1.75	0.00	18,055
08/19/1999	5:00	-195	308.09	0.16	0.0	28,269,132	290.00	-1.79	0.00	18,055
08/19/1999	6:00	-135	308.13	0.12	0.0	28,269,132	290.05	-1.84	0.00	18,055
08/19/1999	7:00	-75	308.15	0.10	0.0	28,269,132	290.10	-1.89	0.00	18,055
08/19/1999	8:00	-15	308.19	0.06	0.0	28,269,132	290.15	-1.94	0.00	18,055
08/19/1999	8:12	-2.10	308.19	0.06	0.0	28,269,132	290.15	-1.94	0.00	18,055
08/19/1999	8:12	-2.07	308.26	-0.01	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:12	-2.02	308.25	0.00	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.98	308.26	-0.01	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.93	308.26	-0.01	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.88	308.26	-0.01	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.85	308.26	-0.01	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.80	308.26	-0.01	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.77	308.26	-0.01	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.72	308.25	0.00	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.67	308.28	-0.03	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.63	308.26	-0.01	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.58	308.26	-0.01	0.0	28,269,132	0.00	0.00	0.00	18,055
08/19/1999	8:13	-1.55	308.26	-0.01	0.0	28,269,132	290.15	-1.94	0.00	18,055
08/19/1999	8:13	-1.50	308.26	-0.01	0.0	28,269,132	290.11	-1.90	0.00	18,055
08/19/1999	8:13	-1.45	308.26	-0.01	0.0	28,269,132	289.86	-1.65	0.00	18,055
08/19/1999	8:13	-1.42	308.26	-0.01	0.0	28,269,132	289.57	-1.36	0.00	18,055
08/19/1999	8:13	-1.37	308.26	-0.01	0.0	28,269,132	289.24	-1.03	0.00	18,055
08/19/1999	8:13	-1.33	308.25	0.00	0.0	28,269,132	288.96	-0.75	0.00	18,055
08/19/1999	8:13	-1.28	308.26	-0.01	0.0	28,269,132	288.75	-0.54	0.00	18,055
08/19/1999	8:13	-1.23	308.29	-0.04	0.0	28,269,132	288.60	-0.39	0.00	18,055
08/19/1999	8:13	-1.20	308.26	-0.01	0.0	28,269,132	288.50	-0.29	0.00	18,055
08/19/1999	8:13	-1.15	308.26	-0.01	0.0	28,269,132	288.42	-0.21	0.00	18,055
08/19/1999	8:13	-1.10	308.29	-0.04	0.0	28,269,132	288.37	-0.16	0.00	18,055
08/19/1999	8:13	-1.05	308.26	-0.01	0.0	28,269,132	288.34	-0.13	0.00	18,055
08/19/1999	8:14	-1.00	308.26	-0.01	0.0	28,269,132	288.31	-0.10	0.00	18,055
08/19/1999	8:14	-0.93	308.29	-0.04	0.0	28,269,132	288.28	-0.07	0.00	18,055
08/19/1999	8:14	-0.87	308.29	-0.04	0.0	28,269,132	288.28	-0.07	0.00	18,055
08/19/1999	8:14	-0.80	308.23	0.01	0.0	28,269,132	288.26	-0.05	0.00	18,055
08/19/1999	8:14	-0.73	308.22	0.03	0.0	28,269,132	288.25	-0.04	0.00	18,055
08/19/1999	8:14	-0.67	308.23	0.01	0.0	28,269,132	288.25	-0.04	0.00	18,055
08/19/1999	8:14	-0.58	308.22	0.03	0.0	28,269,132	288.23	-0.02	0.00	18,055
08/19/1999	8:14	-0.50	308.23	0.01	0.0	28,269,132	288.23	-0.02	0.00	18,055
08/19/1999	8:14	-0.40	308.23	0.01	0.0	28,269,132	288.22	-0.01	0.00	18,055

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/19/1999	8:14	-0.32	308.23	0.01	0.0	28,269,132	288.22	-0.01	0.00	18,055
08/19/1999	8:14	-0.22	308.26	-0.01	0.0	28,269,132	288.22	-0.01	0.00	18,055
08/19/1999	8:14	-0.12	308.26	-0.01	0.0	28,269,132	288.21	0.00	0.00	18,055
08/19/1999	8:15	0.00	308.25	0.00	0.0	28,269,132	288.21	0.00	0.0	18,055
08/19/1999	8:15	0.12	308.26	-0.01	0.0	28,269,132	288.21	0.00	348.8	18,096
08/19/1999	8:15	0.25	308.26	-0.01	0.0	28,269,132	288.20	0.01	348.8	18,142
08/19/1999	8:15	0.38	308.26	-0.01	0.0	28,269,132	284.67	3.55	348.8	18,189
08/19/1999	8:15	0.52	308.26	-0.01	0.0	28,269,132	284.97	3.24	348.8	18,235
08/19/1999	8:15	0.67	308.26	-0.01	0.0	28,269,132	283.83	4.38	348.8	18,288
08/19/1999	8:15	0.82	308.26	-0.01	0.0	28,269,132	282.07	6.14	348.8	18,340
08/19/1999	8:16	1.00	308.26	-0.01	0.0	28,269,132	281.25	6.96	348.8	18,404
08/19/1999	8:16	1.17	308.26	-0.01	0.0	28,269,132	280.68	7.53	348.8	18,462
08/19/1999	8:16	1.35	308.26	-0.01	0.0	28,269,132	280.47	7.74	348.8	18,526
08/19/1999	8:16	1.55	308.29	-0.04	0.0	28,269,132	280.25	7.96	348.8	18,596
08/19/1999	8:16	1.77	308.26	-0.01	0.0	28,269,132	280.06	8.15	348.8	18,671
08/19/1999	8:16	1.98	308.26	-0.01	0.0	28,269,132	279.97	8.24	348.8	18,747
08/19/1999	8:17	2.22	308.29	-0.04	0.0	28,269,132	279.85	8.36	348.8	18,828
08/19/1999	8:17	2.47	308.29	-0.04	0.0	28,269,132	279.76	8.45	348.8	18,915
08/19/1999	8:17	2.73	308.29	-0.04	0.0	28,269,132	279.71	8.50	348.8	19,008
08/19/1999	8:18	3.02	308.26	-0.01	0.0	28,269,132	279.64	8.57	348.8	19,107
08/19/1999	8:18	3.32	308.25	0.00	0.0	28,269,132	279.56	8.65	348.8	19,212
08/19/1999	8:18	3.63	308.26	-0.01	0.0	28,269,132	279.51	8.70	348.8	19,322
08/19/1999	8:18	3.97	308.23	0.01	0.0	28,269,132	279.45	8.76	348.8	19,439
08/19/1999	8:19	4.32	308.23	0.01	0.0	28,269,132	279.40	8.81	348.8	19,561
08/19/1999	8:19	4.68	308.25	0.00	0.0	28,269,132	279.30	8.91	348.8	19,689
08/19/1999	8:20	5.08	308.23	0.01	0.0	28,269,132	279.24	8.97	348.8	19,828
08/19/1999	8:20	5.50	308.23	0.01	0.0	28,269,132	279.21	9.00	348.8	19,973
08/19/1999	8:20	5.95	308.25	0.00	0.0	28,269,132	279.13	9.08	348.8	20,130
08/19/1999	8:21	6.42	308.25	0.00	0.0	28,269,132	279.06	9.15	348.8	20,293
08/19/1999	8:21	6.92	308.22	0.03	0.0	28,269,132	279.03	9.19	348.8	20,468
08/19/1999	8:22	7.45	308.23	0.01	0.0	28,269,132	278.95	9.26	348.8	20,654
08/19/1999	8:23	8.00	308.23	0.01	0.0	28,269,132	278.87	9.35	348.8	20,845
08/19/1999	8:23	8.60	308.25	0.00	0.0	28,269,132	278.84	9.37	348.8	21,055
08/19/1999	8:24	9.23	308.22	0.03	0.0	28,269,132	278.78	9.43	348.8	21,276
08/19/1999	8:24	9.88	308.23	0.01	0.0	28,269,132	278.77	9.44	348.8	21,502
08/19/1999	8:25	10.6	308.25	0.00	0.0	28,269,132	278.70	9.51	348.8	21,752
08/19/1999	8:26	11.3	308.23	0.01	0.0	28,269,132	278.64	9.57	348.8	22,008
08/19/1999	8:27	12.1	308.23	0.01	0.0	28,269,132	278.57	9.64	348.8	22,287
08/19/1999	8:27	13.0	308.23	0.01	0.0	28,269,132	278.54	9.67	348.8	22,578
08/19/1999	8:28	13.9	308.23	0.01	0.0	28,269,132	278.46	9.75	348.8	22,886
08/19/1999	8:29	14.8	308.20	0.04	0.0	28,269,132	278.43	9.78	348.8	23,217
08/19/1999	8:30	15.8	308.23	0.01	0.0	28,269,132	278.40	9.81	348.8	23,560
08/19/1999	8:31	16.8	308.22	0.03	0.0	28,269,132	278.38	9.83	348.8	23,927
08/19/1999	8:32	18.0	308.23	0.01	0.0	28,269,132	278.32	9.89	348.8	24,316
08/19/1999	8:34	19.1	308.23	0.01	0.0	28,269,132	278.28	9.93	348.8	24,729
08/19/1999	8:35	20	308.23	0.01	0.0	28,269,132	278.24	9.97	348.8	25,165
08/19/1999	8:36	22	308.22	0.03	0.0	28,269,132	278.21	10.00	348.8	25,630
08/19/1999	8:38	23	308.22	0.03	0.0	28,269,132	278.15	10.06	348.8	26,118
08/19/1999	8:39	25	308.22	0.03	0.0	28,269,132	278.14	10.07	348.8	26,641
08/19/1999	8:41	26	308.23	0.01	0.0	28,269,132	278.05	10.16	348.8	27,188
08/19/1999	8:42	28	308.20	0.04	0.0	28,269,132	278.07	10.14	348.8	27,769
08/19/1999	8:44	30	308.20	0.04	0.0	28,269,132	278.03	10.18	348.8	28,391
08/19/1999	8:46	32	308.22	0.03	0.0	28,269,132	278.00	10.21	348.8	29,042
08/19/1999	8:48	33	308.23	0.01	0.0	28,269,132	277.94	10.28	348.8	29,734
08/19/1999	8:50	36	308.20	0.04	0.0	28,269,132	277.94	10.27	348.8	30,467
08/19/1999	8:52	38	308.19	0.06	0.0	28,269,132	277.91	10.30	348.8	31,246
08/19/1999	8:55	40	308.19	0.06	0.0	28,269,132	277.87	10.34	348.8	32,065
08/19/1999	8:57	43	308.19	0.06	0.0	28,269,132	277.81	10.40	348.8	32,937
08/19/1999	9:00	45	308.20	0.04	0.0	28,269,132	277.77	10.45	348.8	33,862

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/19/1999	9:03	48	308.20	0.04	0.0	28,269,132	277.78	10.43	348.8	34,838
08/19/1999	9:06	51	308.18	0.07	0.0	28,269,132	277.71	10.50	348.8	35,873
08/19/1999	9:09	54	308.16	0.09	0.0	28,269,132	277.72	10.49	348.8	36,972
08/19/1999	9:12	58	308.18	0.07	0.0	28,269,132	277.68	10.53	348.8	38,135
08/19/1999	9:16	61	308.16	0.09	0.0	28,269,132	277.68	10.53	348.8	39,367
08/19/1999	9:19	65	308.18	0.07	0.0	28,269,132	277.68	10.53	348.8	40,669
08/19/1999	9:23	69	308.15	0.10	0.0	28,269,132	277.55	10.66	348.8	42,053
08/19/1999	9:27	73	308.16	0.09	0.0	28,269,132	277.55	10.66	348.8	43,512
08/19/1999	9:32	77	308.16	0.09	0.0	28,269,132	277.53	10.69	348.8	45,064
08/19/1999	9:37	82	308.15	0.10	0.0	28,269,132	277.46	10.75	348.8	46,704
08/19/1999	9:42	87	308.16	0.09	0.0	28,269,132	277.41	10.80	348.8	48,448
08/19/1999	9:47	92	308.16	0.09	0.0	28,269,132	277.40	10.82	348.8	50,285
08/19/1999	9:53	98	308.15	0.10	0.0	28,269,132	277.37	10.84	348.8	52,238
08/19/1999	9:58	104	308.18	0.07	0.0	28,269,132	277.29	10.92	348.8	54,308
08/19/1999	10:05	110	308.18	0.07	0.0	28,269,132	277.26	10.95	348.8	56,494
08/19/1999	10:11	117	308.15	0.10	0.0	28,269,132	277.22	10.99	348.8	58,813
08/19/1999	10:18	124	308.13	0.12	0.0	28,269,132	277.21	11.00	348.8	61,272
08/19/1999	10:26	131	308.13	0.12	0.0	28,269,132	277.16	11.05	348.8	63,871
08/19/1999	10:34	139	308.13	0.12	0.0	28,269,132	274.25	13.96	348.8	66,626
08/19/1999	10:42	148	308.12	0.13	0.0	28,269,132	274.03	14.18	348.8	69,545
08/19/1999	10:51	156	308.10	0.14	0.0	28,269,132	273.97	14.24	348.8	72,638
08/19/1999	11:00	166	308.09	0.16	0.0	28,269,132	273.88	14.33	348.8	75,916
08/19/1999	11:10	176	308.10	0.14	0.0	28,269,132	273.78	14.43	348.8	79,387
08/19/1999	11:20	186	308.09	0.16	0.0	28,269,132	273.68	14.53	348.8	82,875
08/19/1999	11:30	196	308.09	0.16	0.0	28,269,132	273.60	14.61	348.8	86,363
08/19/1999	11:40	206	308.08	0.17	0.0	28,269,132	273.53	14.69	348.8	89,851
08/19/1999	11:50	216	308.06	0.19	0.0	28,269,132	273.39	14.82	348.8	93,339
08/19/1999	12:00	226	308.06	0.19	0.0	28,269,132	273.36	14.85	348.8	96,827
08/19/1999	12:10	236	308.06	0.19	0.0	28,269,132	273.25	14.96	348.8	100,316
08/19/1999	12:20	246	308.06	0.19	0.0	28,269,132	273.22	14.99	348.8	103,804
08/19/1999	12:30	256	308.05	0.20	0.0	28,269,132	273.14	15.07	348.8	107,292
08/19/1999	12:40	266	308.05	0.20	0.0	28,269,132	273.13	15.08	348.8	110,780
08/19/1999	12:50	276	308.05	0.20	0.0	28,269,132	273.06	15.15	348.8	114,268
08/19/1999	13:00	286	308.03	0.22	0.0	28,269,132	272.98	15.23	348.8	117,756
08/19/1999	13:10	296	308.05	0.20	0.0	28,269,132	272.96	15.25	348.8	121,244
08/19/1999	13:20	306	308.02	0.23	0.0	28,269,132	272.81	15.40	348.8	124,732
08/19/1999	13:30	316	308.03	0.22	0.0	28,269,132	272.80	15.41	348.8	128,220
08/19/1999	13:40	326	308.02	0.23	0.0	28,269,132	272.77	15.44	348.8	131,708
08/19/1999	13:50	336	308.00	0.25	0.0	28,269,132	272.68	15.53	348.8	135,196
08/19/1999	14:00	346	308.00	0.25	0.0	28,269,132	272.66	15.55	348.8	138,684
08/19/1999	14:10	356	308.00	0.25	0.0	28,269,132	272.67	15.55	348.8	142,172
08/19/1999	14:20	366	308.00	0.25	0.0	28,269,132	272.67	15.55	348.8	145,661
08/19/1999	14:30	376	308.00	0.25	0.0	28,269,132	272.75	15.46	348.8	149,149
08/19/1999	14:40	386	308.00	0.25	0.0	28,269,132	272.82	15.39	348.8	152,637
08/19/1999	14:50	396	308.00	0.25	0.0	28,269,132	272.80	15.41	348.8	156,125
08/19/1999	15:00	406	307.99	0.26	0.0	28,269,132	272.84	15.37	348.8	159,613
08/19/1999	15:10	416	307.99	0.26	0.0	28,269,132	272.88	15.33	348.8	163,101
08/19/1999	15:20	426	307.99	0.26	0.0	28,269,132	272.87	15.34	348.8	166,589
08/19/1999	15:30	436	307.97	0.27	0.0	28,269,132	272.83	15.38	348.8	170,077
08/19/1999	15:40	446	307.97	0.27	0.0	28,269,132	272.89	15.32	348.8	173,565
08/19/1999	15:50	456	307.96	0.29	0.0	28,269,132	272.83	15.39	348.8	177,053
08/19/1999	16:00	466	307.96	0.29	0.0	28,269,132	272.86	15.35	348.8	180,541
08/19/1999	16:10	476	307.96	0.29	0.0	28,269,132	272.88	15.33	348.8	184,029
08/19/1999	16:20	486	307.96	0.29	0.0	28,269,132	272.84	15.37	348.8	187,517
08/19/1999	16:30	496	307.96	0.29	0.0	28,269,132	272.85	15.36	348.8	191,006
08/19/1999	16:40	506	307.96	0.29	0.0	28,269,132	272.86	15.35	348.8	194,494
08/19/1999	16:50	516	307.96	0.29	0.0	28,269,132	272.89	15.32	348.8	197,982
08/19/1999	17:00	526	307.95	0.30	0.0	28,269,132	272.88	15.33	348.8	201,470
08/19/1999	17:10	536	307.95	0.30	0.0	28,269,132	272.86	15.35	348.8	204,958

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #3 & Well #4
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/19/1999	17:20	546	307.93	0.32	0.0	28,269,132	272.83	15.38	348.8	208,446
08/19/1999	17:30	556	307.95	0.30	0.0	28,269,132	272.83	15.38	348.8	211,934
08/19/1999	17:40	566	307.93	0.32	0.0	28,269,132	272.78	15.43	348.8	215,422
08/19/1999	17:50	576	307.93	0.32	0.0	28,269,132	272.80	15.41	348.8	218,910
08/19/1999	18:00	586	307.95	0.30	0.0	28,269,132	272.82	15.39	348.8	222,398
08/19/1999	18:10	596	307.93	0.32	0.0	28,269,132	272.80	15.41	348.8	225,886
08/19/1999	18:20	606	307.95	0.30	0.0	28,269,132	272.79	15.43	348.8	229,374
08/19/1999	18:30	616	307.93	0.32	0.0	28,269,132	272.77	15.44	348.8	232,862
08/19/1999	18:40	626	307.93	0.32	0.0	28,269,132	272.74	15.47	348.8	236,351
08/19/1999	18:50	636	307.93	0.32	0.0	28,269,132	272.79	15.42	348.8	239,839
08/19/1999	19:00	646	307.93	0.32	0.0	28,269,132	272.82	15.39	348.8	243,327
08/19/1999	19:10	656	307.92	0.33	0.0	28,269,132	272.75	15.46	348.8	246,815
08/19/1999	19:20	666	307.93	0.32	0.0	28,269,132	272.80	15.41	348.8	250,303
08/19/1999	19:30	676	307.93	0.32	0.0	28,269,132	272.80	15.42	348.8	253,791
08/19/1999	19:40	686	307.92	0.33	0.0	28,269,132	272.78	15.43	348.8	257,279
08/19/1999	19:50	696	307.90	0.35	0.0	28,269,132	272.77	15.44	348.8	260,767
08/19/1999	20:00	706	307.90	0.35	0.0	28,269,132	272.83	15.38	348.8	264,255
08/19/1999	20:10	716	307.89	0.36	0.0	28,269,132	272.76	15.45	348.8	267,743
08/19/1999	20:20	726	307.89	0.36	0.0	28,269,132	272.75	15.46	348.8	271,231
08/19/1999	20:30	736	307.90	0.35	0.0	28,269,132	272.79	15.42	348.8	274,719
08/19/1999	20:40	746	307.90	0.35	0.0	28,269,132	272.81	15.40	348.8	278,207
08/19/1999	20:50	756	307.89	0.36	0.0	28,269,132	272.80	15.41	348.8	281,696
08/19/1999	21:00	766	307.87	0.38	0.0	28,269,132	272.79	15.42	348.8	285,184
08/19/1999	21:10	776	307.89	0.36	0.0	28,269,132	272.77	15.44	348.8	288,672
08/19/1999	21:20	786	307.89	0.36	0.0	28,269,132	272.83	15.38	348.8	292,160
08/19/1999	21:30	796	307.89	0.36	0.0	28,269,132	272.75	15.46	348.8	295,648
08/19/1999	21:40	806	307.89	0.36	0.0	28,269,132	272.74	15.47	348.8	299,136
08/19/1999	21:50	816	307.87	0.38	0.0	28,269,132	272.73	15.48	348.8	302,624
08/19/1999	22:00	826	307.87	0.38	0.0	28,269,132	272.72	15.49	348.8	306,112
08/19/1999	22:10	836	307.87	0.38	0.0	28,269,132	272.77	15.44	348.8	309,600
08/19/1999	22:20	846	307.87	0.38	0.0	28,269,132	272.71	15.50	348.8	313,088
08/19/1999	22:30	856	307.86	0.39	0.0	28,269,132	272.73	15.48	348.8	316,576
08/19/1999	22:40	866	307.87	0.38	0.0	28,269,132	272.74	15.47	348.8	320,064
08/19/1999	22:50	876	307.87	0.38	0.0	28,269,132	272.71	15.50	348.8	323,552
08/19/1999	23:00	886	307.87	0.38	0.0	28,269,132	272.71	15.50	348.8	327,041
08/19/1999	23:10	896	307.87	0.38	0.0	28,269,132	272.71	15.50	348.8	330,529
08/19/1999	23:20	906	307.87	0.38	0.0	28,269,132	272.63	15.58	348.8	334,017
08/19/1999	23:30	916	307.87	0.38	0.0	28,269,132	272.69	15.52	348.8	337,505
08/19/1999	23:40	926	307.87	0.38	0.0	28,269,132	272.68	15.53	348.8	340,993
08/19/1999	23:50	936	307.87	0.38	0.0	28,269,132	272.65	15.57	348.8	344,481
08/20/1999	0:00	946	307.86	0.39	0.0	28,269,132	272.67	15.54	348.8	347,969
08/20/1999	0:10	956	307.89	0.36	0.0	28,269,132	272.65	15.57	348.8	351,457
08/20/1999	0:20	966	307.87	0.38	0.0	28,269,132	272.64	15.57	348.8	354,945
08/20/1999	0:30	976	307.87	0.38	0.0	28,269,132	272.67	15.54	348.8	358,433
08/20/1999	0:40	986	307.87	0.38	0.0	28,269,132	272.65	15.57	348.8	361,921
08/20/1999	0:50	996	307.86	0.39	0.0	28,269,132	272.61	15.60	348.8	365,409
08/20/1999	1:00	1,006	307.87	0.38	0.0	28,269,132	272.67	15.54	348.8	368,897
08/20/1999	1:10	1,016	307.87	0.38	0.0	28,269,132	272.59	15.62	348.8	372,386
08/20/1999	1:20	1,026	307.87	0.38	0.0	28,269,132	272.57	15.64	348.8	375,874
08/20/1999	1:30	1,036	307.87	0.38	0.0	28,269,132	272.61	15.60	348.8	379,362
08/20/1999	1:40	1,046	307.86	0.39	0.0	28,269,132	272.57	15.64	348.8	382,850
08/20/1999	1:50	1,056	307.86	0.39	0.0	28,269,132	272.57	15.64	348.8	386,338
08/20/1999	2:00	1,066	307.86	0.39	0.0	28,269,132	272.58	15.63	348.8	389,826
08/20/1999	2:10	1,076	307.86	0.39	0.0	28,269,132	272.54	15.67	348.8	393,314
08/20/1999	2:20	1,086	307.86	0.39	0.0	28,269,132	272.55	15.66	348.8	396,802
08/20/1999	2:30	1,096	307.86	0.39	0.0	28,269,132	272.57	15.64	348.8	400,290
08/20/1999	2:40	1,106	307.86	0.39	0.0	28,269,132	272.57	15.64	348.8	403,778
08/20/1999	2:50	1,116	307.86	0.39	0.0	28,269,132	272.53	15.68	348.8	407,266
08/20/1999	3:00	1,126	307.86	0.39	0.0	28,269,132	272.59	15.62	348.8	410,754

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/20/1999	3:10	1,136	307.84	0.40	0.0	28,269,132	272.53	15.68	348.8	414,243
08/20/1999	3:20	1,146	307.84	0.40	0.0	28,269,132	272.52	15.69	348.8	417,731
08/20/1999	3:30	1,156	307.86	0.39	0.0	28,269,132	272.57	15.64	348.8	421,219
08/20/1999	3:40	1,166	307.84	0.40	0.0	28,269,132	272.53	15.68	348.8	424,707
08/20/1999	3:50	1,176	307.84	0.40	0.0	28,269,132	272.52	15.69	348.8	428,195
08/20/1999	4:00	1,186	307.84	0.40	0.0	28,269,132	272.52	15.69	348.8	431,683
08/20/1999	4:10	1,196	307.84	0.40	0.0	28,269,132	272.49	15.72	348.8	435,171
08/20/1999	4:20	1,206	307.86	0.39	0.0	28,269,132	272.48	15.73	348.8	438,659
08/20/1999	4:30	1,216	307.86	0.39	0.0	28,269,132	272.49	15.72	348.8	442,147
08/20/1999	4:40	1,226	307.84	0.40	0.0	28,269,132	272.50	15.71	348.8	445,635
08/20/1999	4:50	1,236	307.84	0.40	0.0	28,269,132	272.46	15.75	348.8	449,123
08/20/1999	5:00	1,246	307.84	0.40	0.0	28,269,132	272.46	15.75	348.8	452,611
08/20/1999	5:10	1,256	307.84	0.40	0.0	28,269,132	272.45	15.76	348.8	456,099
08/20/1999	5:20	1,266	307.84	0.40	0.0	28,269,132	272.45	15.76	348.8	459,588
08/20/1999	5:30	1,276	307.84	0.40	0.0	28,269,132	272.43	15.78	348.8	463,076
08/20/1999	5:40	1,286	307.82	0.43	0.0	28,269,132	272.46	15.75	348.8	466,564
08/20/1999	5:50	1,296	307.86	0.39	0.0	28,269,132	272.51	15.70	348.8	470,052
08/20/1999	6:00	1,306	307.84	0.40	0.0	28,269,132	272.48	15.73	348.8	473,540
08/20/1999	6:10	1,316	307.82	0.43	0.0	28,269,132	272.43	15.78	348.8	477,028
08/20/1999	6:20	1,326	307.82	0.43	0.0	28,269,132	272.43	15.78	348.8	480,516
08/20/1999	6:30	1,336	307.82	0.43	0.0	28,269,132	272.50	15.71	348.8	484,004
08/20/1999	6:40	1,346	307.82	0.43	0.0	28,269,132	272.43	15.78	348.8	487,492
08/20/1999	6:50	1,356	307.80	0.45	0.0	28,269,132	272.42	15.79	348.8	490,980
08/20/1999	7:00	1,366	307.82	0.43	0.0	28,269,132	272.41	15.80	348.8	494,468
08/20/1999	7:10	1,376	307.82	0.43	0.0	28,269,132	272.47	15.74	348.8	497,956
08/20/1999	7:20	1,386	307.82	0.43	0.0	28,269,132	272.43	15.78	348.8	501,444
08/20/1999	7:30	1,396	307.82	0.43	0.0	28,269,132	272.39	15.82	348.8	504,933
08/20/1999	7:40	1,406	307.80	0.45	0.0	28,269,132	0.00	0.00	348.8	508,421
08/20/1999	7:50	1,416	307.80	0.45	0.0	28,269,132	0.00	0.00	348.8	511,909
08/20/1999	8:00	1,426	307.80	0.45	0.0	28,269,132	0.00	0.00	348.8	515,397
08/20/1999	8:10	1,436	307.79	0.46	0.0	28,269,132	0.00	0.00	348.8	518,885
08/20/1999	8:20	1,446	307.79	0.46	0.0	28,269,132	0.00	0.00	348.8	522,373
08/20/1999	8:30	1,456	307.79	0.46	0.0	28,269,132	0.00	0.00	348.8	525,861
08/20/1999	8:40	1,466	307.83	0.42	0.0	28,269,132	0.00	0.00	348.8	529,349
08/20/1999	8:50	1,476	307.79	0.46	0.0	28,269,132	0.00	0.00	348.8	532,837
08/20/1999	9:00	1,486	307.77	0.48	0.0	28,269,132	0.00	0.00	348.8	536,325
08/20/1999	9:10	1,496	307.77	0.48	0.0	28,269,132	0.00	0.00	348.8	539,813
08/20/1999	9:20	1,506	307.79	0.46	0.0	28,269,132	0.00	0.00	348.8	543,301
08/20/1999	9:30	1,516	307.79	0.46	0.0	28,269,132	0.00	0.00	348.8	546,789
08/20/1999	9:40	1,526	307.80	0.45	0.0	28,269,132	0.00	0.00	348.8	550,278
08/20/1999	9:50	1,536	307.79	0.46	0.0	28,269,132	269.70	18.51	348.8	553,766
08/20/1999	10:00	1,546	307.79	0.46	0.0	28,269,132	269.36	18.86	348.8	557,254
08/20/1999	10:10	1,556	307.76	0.49	0.0	28,269,132	269.15	19.06	348.8	560,742
08/20/1999	10:20	1,566	307.79	0.46	0.0	28,269,132	268.93	19.29	348.8	564,230
08/20/1999	10:30	1,576	307.79	0.46	0.0	28,269,132	268.77	19.44	348.8	567,718
08/20/1999	10:40	1,586	307.77	0.48	0.0	28,269,132	268.60	19.61	348.8	571,206
08/20/1999	10:50	1,596	307.76	0.49	0.0	28,269,132	268.49	19.72	348.8	574,694
08/20/1999	11:00	1,606	307.76	0.49	0.0	28,269,132	268.37	19.84	348.8	578,182
08/20/1999	11:10	1,616	307.74	0.50	0.0	28,269,132	268.23	19.98	348.8	581,670
08/20/1999	11:20	1,626	307.73	0.52	0.0	28,269,132	268.09	20.12	348.8	585,158
08/20/1999	11:30	1,636	307.74	0.50	0.0	28,269,132	267.88	20.33	348.8	588,646
08/20/1999	11:40	1,646	307.73	0.52	0.0	28,269,132	267.68	20.53	348.8	592,134
08/20/1999	11:50	1,656	307.73	0.52	0.0	28,269,132	267.59	20.62	348.8	595,623
08/20/1999	12:00	1,666	307.71	0.53	0.0	28,269,132	267.47	20.74	348.8	599,111
08/20/1999	12:10	1,676	307.73	0.52	0.0	28,269,132	267.45	20.76	348.8	602,599
08/20/1999	12:20	1,686	307.69	0.56	0.0	28,269,132	267.44	20.77	348.8	606,087
08/20/1999	12:30	1,696	307.71	0.53	0.0	28,269,132	267.47	20.74	348.8	609,575
08/20/1999	12:40	1,706	307.71	0.53	0.0	28,269,132	267.46	20.75	348.8	613,063
08/20/1999	12:50	1,716	307.69	0.56	0.0	28,269,132	267.42	20.79	348.8	616,551

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/20/1999	13:00	1,726	307.69	0.56	0.0	28,269,132	267.45	20.76	348.8	620,039
08/20/1999	13:10	1,736	307.67	0.58	0.0	28,269,132	267.49	20.72	348.8	623,527
08/20/1999	13:20	1,746	307.69	0.56	0.0	28,269,132	267.42	20.79	348.8	627,015
08/20/1999	13:30	1,756	307.69	0.56	0.0	28,269,132	267.42	20.79	348.8	630,503
08/20/1999	13:40	1,766	307.67	0.58	0.0	28,269,132	267.44	20.77	348.8	633,991
08/20/1999	13:50	1,776	307.69	0.56	0.0	28,269,132	267.46	20.76	348.8	637,479
08/20/1999	14:00	1,786	307.67	0.58	0.0	28,269,132	267.46	20.76	348.8	640,968
08/20/1999	14:10	1,796	307.64	0.61	0.0	28,269,132	267.46	20.75	348.8	644,456
08/20/1999	14:20	1,806	307.66	0.59	0.0	28,269,132	267.49	20.72	348.8	647,944
08/20/1999	14:30	1,816	307.63	0.62	0.0	28,269,132	267.46	20.75	348.8	651,432
08/20/1999	14:40	1,826	307.63	0.62	0.0	28,269,132	267.46	20.75	348.8	654,920
08/20/1999	14:50	1,836	307.63	0.62	0.0	28,269,132	267.49	20.72	348.8	658,408
08/20/1999	15:00	1,846	307.61	0.63	0.0	28,269,132	267.50	20.71	348.8	661,896
08/20/1999	15:10	1,856	307.60	0.65	0.0	28,269,132	267.45	20.76	348.8	665,384
08/20/1999	15:20	1,866	307.58	0.66	0.0	28,269,132	267.46	20.75	348.8	668,872
08/20/1999	15:30	1,876	307.57	0.68	0.0	28,269,132	267.50	20.72	348.8	672,360
08/20/1999	15:40	1,886	307.58	0.66	0.0	28,269,132	267.51	20.70	348.8	675,848
08/20/1999	15:50	1,896	307.58	0.66	0.0	28,269,132	267.48	20.73	348.8	679,336
08/20/1999	16:00	1,906	307.58	0.66	0.0	28,269,132	267.51	20.70	348.8	682,824
08/20/1999	16:10	1,916	307.56	0.69	0.0	28,269,132	267.53	20.68	348.8	686,313
08/20/1999	16:20	1,926	307.56	0.69	0.0	28,269,132	267.48	20.73	348.8	689,801
08/20/1999	16:30	1,936	307.56	0.69	0.0	28,269,132	267.50	20.71	348.8	693,289
08/20/1999	16:40	1,946	307.54	0.71	0.0	28,269,132	267.53	20.68	348.8	696,777
08/20/1999	16:50	1,956	307.53	0.72	0.0	28,269,132	267.50	20.71	496.4	701,741
08/20/1999	17:00	1,966	307.57	0.68	0.0	28,269,132	267.49	20.73	496.4	706,705
08/20/1999	17:10	1,976	307.51	0.74	0.0	28,269,132	267.52	20.69	496.4	711,668
08/20/1999	17:20	1,986	307.53	0.72	0.0	28,269,132	267.51	20.70	496.4	716,632
08/20/1999	17:30	1,996	307.51	0.74	0.0	28,269,132	267.50	20.71	496.4	721,596
08/20/1999	17:40	2,006	307.51	0.74	0.0	28,269,132	267.53	20.68	496.4	726,560
08/20/1999	17:50	2,016	307.50	0.75	0.0	28,269,132	267.51	20.70	496.4	731,524
08/20/1999	18:00	2,026	307.50	0.75	0.0	28,269,132	267.48	20.73	496.4	736,488
08/20/1999	18:10	2,036	307.48	0.76	0.0	28,269,132	267.51	20.70	496.4	741,451
08/20/1999	18:20	2,046	307.48	0.76	0.0	28,269,132	267.50	20.71	496.4	746,415
08/20/1999	18:30	2,056	307.48	0.76	0.0	28,269,132	267.49	20.72	496.4	751,379
08/20/1999	18:40	2,066	307.48	0.76	0.0	28,269,132	267.52	20.69	496.4	756,343
08/20/1999	18:50	2,076	307.48	0.76	0.0	28,269,132	267.50	20.71	496.4	761,307
08/20/1999	19:00	2,086	307.47	0.78	0.0	28,269,132	267.50	20.72	496.4	766,271
08/20/1999	19:10	2,096	307.47	0.78	0.0	28,269,132	267.51	20.70	496.4	771,235
08/20/1999	19:20	2,106	307.46	0.79	0.0	28,269,132	267.45	20.76	496.4	776,198
08/20/1999	19:30	2,116	307.46	0.79	0.0	28,269,132	267.50	20.71	496.4	781,162
08/20/1999	19:40	2,126	307.46	0.79	0.0	28,269,132	267.48	20.73	496.4	786,126
08/20/1999	19:50	2,136	307.46	0.79	0.0	28,269,132	267.47	20.74	496.4	791,090
08/20/1999	20:00	2,146	307.43	0.82	0.0	28,269,132	267.51	20.70	496.4	796,054
08/20/1999	20:10	2,156	307.43	0.82	0.0	28,269,132	267.48	20.74	496.4	801,018
08/20/1999	20:20	2,166	307.44	0.81	0.0	28,269,132	267.49	20.72	496.4	805,982
08/20/1999	20:30	2,176	307.43	0.82	0.0	28,269,132	267.51	20.70	496.4	810,945
08/20/1999	20:40	2,186	307.43	0.82	0.0	28,269,132	267.46	20.75	496.4	815,909
08/20/1999	20:50	2,196	307.41	0.84	0.0	28,269,132	267.52	20.69	496.4	820,873
08/20/1999	21:00	2,206	307.41	0.84	0.0	28,269,132	267.49	20.72	496.4	825,837
08/20/1999	21:10	2,216	307.41	0.84	0.0	28,269,132	267.50	20.72	496.4	830,801
08/20/1999	21:20	2,226	307.41	0.84	0.0	28,269,132	267.51	20.70	496.4	835,765
08/20/1999	21:30	2,236	307.40	0.85	0.0	28,269,132	267.46	20.75	496.4	840,729
08/20/1999	21:40	2,246	307.40	0.85	0.0	28,269,132	267.52	20.69	496.4	845,692
08/20/1999	21:50	2,256	307.38	0.87	0.0	28,269,132	267.49	20.73	496.4	850,656
08/20/1999	22:00	2,266	307.38	0.87	0.0	28,269,132	267.48	20.73	496.4	855,620
08/20/1999	22:10	2,276	307.37	0.88	0.0	28,269,132	267.50	20.71	496.4	860,584
08/20/1999	22:20	2,286	307.38	0.87	0.0	28,269,132	267.47	20.74	496.4	865,548
08/20/1999	22:30	2,296	307.37	0.88	0.0	28,269,132	267.52	20.69	496.4	870,512
08/20/1999	22:40	2,306	307.37	0.88	0.0	28,269,132	267.47	20.75	496.4	875,475

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/20/1999	22:50	2,316	307.37	0.88	0.0	28,269,132	267.50	20.71	496.4	880,439
08/20/1999	23:00	2,326	307.35	0.89	0.0	28,269,132	267.51	20.70	496.4	885,403
08/20/1999	23:10	2,336	307.37	0.88	0.0	28,269,132	267.46	20.76	496.4	890,367
08/20/1999	23:20	2,346	307.35	0.89	0.0	28,269,132	267.46	20.75	496.4	895,331
08/20/1999	23:30	2,356	307.35	0.89	0.0	28,269,132	267.45	20.76	496.4	900,295
08/20/1999	23:40	2,366	307.35	0.89	0.0	28,269,132	267.43	20.78	496.4	905,259
08/20/1999	23:50	2,376	307.34	0.91	0.0	28,269,132	267.50	20.71	496.4	910,222
08/21/1999	0:00	2,386	307.34	0.91	0.0	28,269,132	267.45	20.76	496.4	915,186
08/21/1999	0:10	2,396	307.34	0.91	0.0	28,269,132	267.48	20.73	496.4	920,150
08/21/1999	0:20	2,406	307.33	0.92	0.0	28,269,132	267.46	20.75	496.4	925,114
08/21/1999	0:30	2,416	307.30	0.95	0.0	28,269,132	267.42	20.79	496.4	930,078
08/21/1999	0:40	2,426	307.34	0.91	0.0	28,269,132	267.48	20.73	496.4	935,042
08/21/1999	0:50	2,436	307.31	0.94	0.0	28,269,132	267.43	20.78	496.4	940,006
08/21/1999	1:00	2,446	307.30	0.95	0.0	28,269,132	267.48	20.73	496.4	944,969
08/21/1999	1:10	2,456	307.30	0.95	0.0	28,269,132	267.45	20.77	496.4	949,933
08/21/1999	1:20	2,466	307.28	0.97	0.0	28,269,132	267.43	20.79	496.4	954,897
08/21/1999	1:30	2,476	307.28	0.97	0.0	28,269,132	267.46	20.75	496.4	959,861
08/21/1999	1:40	2,486	307.28	0.97	0.0	28,269,132	267.43	20.78	496.4	964,825
08/21/1999	1:50	2,496	307.27	0.98	0.0	28,269,132	267.48	20.74	496.4	969,789
08/21/1999	2:00	2,506	307.28	0.97	0.0	28,269,132	267.45	20.76	496.4	974,753
08/21/1999	2:10	2,516	307.27	0.98	0.0	28,269,132	267.42	20.79	496.4	979,716
08/21/1999	2:20	2,526	307.27	0.98	0.0	28,269,132	267.46	20.75	496.4	984,680
08/21/1999	2:30	2,536	307.27	0.98	0.0	28,269,132	267.42	20.79	496.4	989,644
08/21/1999	2:40	2,546	307.27	0.98	0.0	28,269,132	267.48	20.73	496.4	994,608
08/21/1999	2:50	2,556	307.30	0.95	0.0	28,269,132	267.43	20.78	496.4	999,572
08/21/1999	3:00	2,566	307.25	1.00	0.0	28,269,132	267.40	20.81	496.4	1,004,536
08/21/1999	3:10	2,576	307.25	1.00	0.0	28,269,132	267.45	20.76	496.4	1,009,500
08/21/1999	3:20	2,586	307.25	1.00	0.0	28,269,132	267.42	20.79	496.4	1,014,463
08/21/1999	3:30	2,596	307.24	1.01	0.0	28,269,132	267.48	20.73	496.4	1,019,427
08/21/1999	3:40	2,606	307.24	1.01	0.0	28,269,132	267.44	20.77	496.4	1,024,391
08/21/1999	3:50	2,616	307.24	1.01	0.0	28,269,132	267.41	20.80	496.4	1,029,355
08/21/1999	4:00	2,626	307.22	1.02	0.0	28,269,132	267.46	20.75	496.4	1,034,319
08/21/1999	4:10	2,636	307.22	1.02	0.0	28,269,132	267.43	20.78	496.4	1,039,283
08/21/1999	4:20	2,646	307.22	1.02	0.0	28,269,132	267.46	20.75	496.4	1,044,246
08/21/1999	4:30	2,656	307.21	1.04	0.0	28,269,132	267.45	20.76	496.4	1,049,210
08/21/1999	4:40	2,666	307.22	1.02	0.0	28,269,132	267.43	20.78	496.4	1,054,174
08/21/1999	4:50	2,676	307.21	1.04	0.0	28,269,132	267.50	20.71	496.4	1,059,138
08/21/1999	5:00	2,686	307.20	1.05	0.0	28,269,132	267.45	20.76	496.4	1,064,102
08/21/1999	5:10	2,696	307.21	1.04	0.0	28,269,132	267.43	20.79	496.4	1,069,066
08/21/1999	5:20	2,706	307.20	1.05	0.0	28,269,132	267.49	20.72	496.4	1,074,030
08/21/1999	5:30	2,716	307.21	1.04	0.0	28,269,132	267.44	20.77	496.4	1,078,993
08/21/1999	5:40	2,726	307.18	1.07	0.0	28,269,132	267.43	20.78	496.4	1,083,957
08/21/1999	5:50	2,736	307.20	1.05	0.0	28,269,132	267.46	20.75	496.4	1,088,921
08/21/1999	6:00	2,746	307.18	1.07	0.0	28,269,132	267.42	20.79	496.4	1,093,885
08/21/1999	6:10	2,756	307.18	1.07	0.0	28,269,132	267.48	20.73	496.4	1,098,849
08/21/1999	6:20	2,766	307.17	1.08	0.0	28,269,132	267.45	20.76	496.4	1,103,813
08/21/1999	6:30	2,776	307.20	1.05	0.0	28,269,132	267.42	20.79	496.4	1,108,777
08/21/1999	6:40	2,786	307.17	1.08	0.0	28,269,132	267.43	20.78	496.4	1,113,740
08/21/1999	6:50	2,796	307.17	1.08	0.0	28,269,132	267.43	20.78	496.4	1,118,704
08/21/1999	7:00	2,806	307.15	1.10	0.0	28,269,132	267.42	20.79	496.4	1,123,668
08/21/1999	7:10	2,816	307.17	1.08	0.0	28,269,132	267.48	20.73	496.4	1,128,632
08/21/1999	7:20	2,826	307.17	1.08	0.0	28,269,132	267.47	20.74	496.4	1,133,596
08/21/1999	7:30	2,836	307.15	1.10	0.0	28,269,132	267.43	20.78	496.4	1,138,560
08/21/1999	7:40	2,846	307.15	1.10	0.0	28,269,132	267.48	20.73	496.4	1,143,524
08/21/1999	7:50	2,856	307.14	1.11	0.0	28,269,132	267.45	20.76	496.4	1,148,487
08/21/1999	8:00	2,866	307.14	1.11	0.0	28,269,132	267.42	20.79	496.4	1,153,451
08/21/1999	8:10	2,876	307.14	1.11	0.0	28,269,132	267.46	20.75	496.4	1,158,415
08/21/1999	8:20	2,886	307.14	1.11	0.0	28,269,132	267.43	20.78	496.4	1,163,379
08/21/1999	8:30	2,896	307.12	1.13	0.0	28,269,132	267.41	20.80	496.4	1,168,343

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/21/1999	8:40	2,906	307.12	1.13	0.0	28,269,132	267.45	20.76	496.4	1,173,307
08/21/1999	8:50	2,916	307.14	1.11	0.0	28,269,132	267.43	20.78	496.4	1,178,271
08/21/1999	9:00	2,926	307.12	1.13	0.0	28,269,132	267.47	20.75	496.4	1,183,234
08/21/1999	9:10	2,936	307.12	1.13	0.0	28,269,132	267.44	20.77	496.4	1,188,198
08/21/1999	9:20	2,946	307.11	1.14	0.0	28,269,132	267.42	20.79	496.4	1,193,162
08/21/1999	9:30	2,956	307.12	1.13	0.0	28,269,132	267.48	20.73	496.4	1,198,126
08/21/1999	9:40	2,966	307.09	1.15	0.0	28,269,132	267.42	20.79	496.4	1,203,090
08/21/1999	9:50	2,976	307.11	1.14	0.0	28,269,132	267.43	20.78	496.4	1,208,054
08/21/1999	10:00	2,986	307.11	1.14	0.0	28,269,132	267.47	20.75	496.4	1,213,017
08/21/1999	10:10	2,996	307.09	1.15	0.0	28,269,132	267.42	20.79	496.4	1,217,981
08/21/1999	10:20	3,006	307.09	1.15	0.0	28,269,132	267.43	20.78	496.4	1,222,945
08/21/1999	10:30	3,016	307.09	1.15	0.0	28,269,132	267.44	20.77	496.4	1,227,909
08/21/1999	10:40	3,026	307.09	1.15	0.0	28,269,132	267.41	20.80	496.4	1,232,873
08/21/1999	10:50	3,036	307.09	1.15	0.0	28,269,132	267.45	20.76	496.4	1,237,837
08/21/1999	11:00	3,046	307.11	1.14	0.0	28,269,132	267.44	20.77	496.4	1,242,801
08/21/1999	11:10	3,056	307.09	1.15	0.0	28,269,132	267.42	20.79	496.4	1,247,764
08/21/1999	11:20	3,066	307.08	1.17	0.0	28,269,132	267.45	20.76	496.4	1,252,728
08/21/1999	11:30	3,076	307.09	1.15	0.0	28,269,132	267.42	20.79	496.4	1,257,692
08/21/1999	11:40	3,086	307.09	1.15	0.0	28,269,132	267.45	20.76	496.4	1,262,656
08/21/1999	11:50	3,096	307.12	1.13	0.0	28,269,132	267.45	20.76	488.7	1,267,543
08/21/1999	12:00	3,106	307.08	1.17	0.0	28,269,132	267.41	20.81	488.7	1,272,431
08/21/1999	12:10	3,116	307.09	1.15	0.0	28,269,132	267.37	20.84	488.7	1,277,318
08/21/1999	12:20	3,126	307.07	1.18	0.0	28,269,132	267.41	20.80	488.7	1,282,206
08/21/1999	12:30	3,136	307.05	1.20	0.0	28,269,132	267.37	20.85	488.7	1,287,093
08/21/1999	12:40	3,146	307.08	1.17	0.0	28,269,132	267.36	20.85	488.7	1,291,981
08/21/1999	12:50	3,156	307.08	1.17	0.0	28,269,132	267.41	20.80	488.7	1,296,868
08/21/1999	13:00	3,166	307.07	1.18	0.0	28,269,132	267.38	20.83	488.7	1,301,756
08/21/1999	13:10	3,176	307.07	1.18	0.0	28,269,132	267.40	20.81	488.7	1,306,643
08/21/1999	13:20	3,186	307.07	1.18	0.0	28,269,132	267.39	20.82	488.7	1,311,531
08/21/1999	13:30	3,196	307.07	1.18	0.0	28,269,132	267.37	20.84	488.7	1,316,418
08/21/1999	13:40	3,206	307.05	1.20	0.0	28,269,132	267.43	20.78	488.7	1,321,306
08/21/1999	13:50	3,216	307.05	1.20	0.0	28,269,132	267.40	20.81	488.7	1,326,193
08/21/1999	14:00	3,226	307.05	1.20	0.0	28,269,132	267.37	20.84	488.7	1,331,081
08/21/1999	14:10	3,236	307.05	1.20	0.0	28,269,132	267.41	20.80	488.7	1,335,968
08/21/1999	14:20	3,246	307.04	1.21	0.0	28,269,132	267.39	20.82	488.7	1,340,855
08/21/1999	14:30	3,256	307.05	1.20	0.0	28,269,132	267.37	20.84	488.7	1,345,743
08/21/1999	14:40	3,266	307.04	1.21	0.0	28,269,132	267.42	20.79	488.7	1,350,630
08/21/1999	14:50	3,276	307.02	1.23	0.0	28,269,132	267.38	20.83	488.7	1,355,518
08/21/1999	15:00	3,286	307.04	1.21	0.0	28,269,132	267.37	20.84	488.7	1,360,405
08/21/1999	15:10	3,296	307.02	1.23	0.0	28,269,132	267.42	20.79	488.7	1,365,293
08/21/1999	15:20	3,306	307.04	1.21	0.0	28,269,132	267.39	20.82	488.7	1,370,180
08/21/1999	15:30	3,316	307.02	1.23	0.0	28,269,132	267.37	20.84	488.7	1,375,068
08/21/1999	15:40	3,326	307.02	1.23	0.0	28,269,132	267.41	20.80	488.7	1,379,955
08/21/1999	15:50	3,336	307.01	1.24	0.0	28,269,132	267.39	20.82	488.7	1,384,843
08/21/1999	16:00	3,346	307.02	1.23	0.0	28,269,132	267.39	20.82	488.7	1,389,730
08/21/1999	16:10	3,356	307.02	1.23	0.0	28,269,132	267.42	20.79	488.7	1,394,618
08/21/1999	16:20	3,366	307.01	1.24	0.0	28,269,132	267.39	20.82	488.7	1,399,505
08/21/1999	16:30	3,376	307.01	1.24	0.0	28,269,132	267.42	20.79	488.7	1,404,393
08/21/1999	16:40	3,386	306.99	1.26	0.0	28,269,132	267.42	20.79	488.7	1,409,280
08/21/1999	16:50	3,396	306.99	1.26	0.0	28,269,132	267.40	20.81	488.7	1,414,168
08/21/1999	17:00	3,406	306.99	1.26	0.0	28,269,132	267.45	20.77	488.7	1,419,055
08/21/1999	17:10	3,416	307.01	1.24	0.0	28,269,132	267.42	20.79	488.7	1,423,942
08/21/1999	17:20	3,426	306.99	1.26	0.0	28,269,132	267.41	20.80	488.7	1,428,830
08/21/1999	17:30	3,436	306.98	1.27	0.0	28,269,132	267.45	20.76	488.7	1,433,717
08/21/1999	17:40	3,446	306.99	1.26	0.0	28,269,132	267.42	20.80	488.7	1,438,605
08/21/1999	17:50	3,456	306.98	1.27	0.0	28,269,132	267.38	20.83	488.7	1,443,492
08/21/1999	18:00	3,466	306.99	1.26	0.0	28,269,132	267.46	20.75	488.7	1,448,380
08/21/1999	18:10	3,476	306.98	1.27	0.0	28,269,132	267.41	20.80	488.7	1,453,267
08/21/1999	18:20	3,486	306.98	1.27	0.0	28,269,132	267.40	20.81	488.7	1,458,155

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/21/1999	18:30	3,496	306.98	1.27	0.0	28,269,132	267.37	20.84	488.7	1,463,042
08/21/1999	18:40	3,506	306.98	1.27	0.0	28,269,132	267.34	20.87	488.7	1,467,930
08/21/1999	18:50	3,516	306.98	1.27	0.0	28,269,132	267.32	20.89	488.7	1,472,817
08/21/1999	19:00	3,526	306.95	1.30	0.0	28,269,132	267.37	20.84	488.7	1,477,705
08/21/1999	19:10	3,536	306.95	1.30	0.0	28,269,132	267.35	20.86	488.7	1,482,592
08/21/1999	19:20	3,546	306.95	1.30	0.0	28,269,132	267.32	20.89	488.7	1,487,480
08/21/1999	19:30	3,556	306.95	1.30	0.0	28,269,132	267.37	20.84	488.7	1,492,367
08/21/1999	19:40	3,566	306.95	1.30	0.0	28,269,132	267.34	20.87	488.7	1,497,254
08/21/1999	19:50	3,576	306.94	1.31	0.0	28,269,132	267.32	20.89	488.7	1,502,142
08/21/1999	20:00	3,586	306.94	1.31	0.0	28,269,132	267.37	20.84	488.7	1,507,029
08/21/1999	20:10	3,596	306.95	1.30	0.0	28,269,132	267.34	20.87	488.7	1,511,917
08/21/1999	20:20	3,606	306.92	1.33	0.0	28,269,132	267.32	20.89	488.7	1,516,804
08/21/1999	20:30	3,616	306.94	1.31	0.0	28,269,132	267.38	20.83	488.7	1,521,692
08/21/1999	20:40	3,626	306.92	1.33	0.0	28,269,132	267.35	20.86	488.7	1,526,579
08/21/1999	20:50	3,636	306.92	1.33	0.0	28,269,132	267.33	20.88	488.7	1,531,467
08/21/1999	21:00	3,646	306.94	1.31	0.0	28,269,132	267.36	20.85	488.7	1,536,354
08/21/1999	21:10	3,656	306.94	1.31	0.0	28,269,132	267.38	20.83	488.7	1,541,242
08/21/1999	21:20	3,666	306.92	1.33	0.0	28,269,132	267.34	20.87	488.7	1,546,129
08/21/1999	21:30	3,676	306.94	1.31	0.0	28,269,132	267.34	20.87	488.7	1,551,017
08/21/1999	21:40	3,686	306.92	1.33	0.0	28,269,132	267.39	20.82	488.7	1,555,904
08/21/1999	21:50	3,696	306.92	1.33	0.0	28,269,132	267.35	20.86	488.7	1,560,792
08/21/1999	22:00	3,706	306.92	1.33	0.0	28,269,132	267.34	20.87	488.7	1,565,679
08/21/1999	22:10	3,716	306.91	1.34	0.0	28,269,132	267.33	20.88	488.7	1,570,566
08/21/1999	22:20	3,726	306.92	1.33	0.0	28,269,132	267.36	20.85	488.7	1,575,454
08/21/1999	22:30	3,736	306.91	1.34	0.0	28,269,132	267.33	20.88	488.7	1,580,341
08/21/1999	22:40	3,746	306.92	1.33	0.0	28,269,132	267.33	20.88	488.7	1,585,229
08/21/1999	22:50	3,756	306.91	1.34	0.0	28,269,132	267.37	20.85	488.7	1,590,116
08/21/1999	23:00	3,766	306.91	1.34	0.0	28,269,132	267.34	20.88	488.7	1,595,004
08/21/1999	23:10	3,776	306.91	1.34	0.0	28,269,132	267.33	20.88	488.7	1,599,891
08/21/1999	23:20	3,786	306.91	1.34	0.0	28,269,132	267.37	20.84	488.7	1,604,779
08/21/1999	23:30	3,796	306.91	1.34	0.0	28,269,132	267.35	20.86	488.7	1,609,666
08/21/1999	23:40	3,806	306.91	1.34	0.0	28,269,132	267.33	20.88	488.7	1,614,554
08/21/1999	23:50	3,816	306.89	1.36	0.0	28,269,132	267.40	20.81	488.7	1,619,441
08/22/1999	0:00	3,826	306.91	1.34	0.0	28,269,132	267.34	20.87	488.7	1,624,329
08/22/1999	0:10	3,836	306.91	1.34	0.0	28,269,132	267.34	20.87	488.7	1,629,216
08/22/1999	0:20	3,846	306.89	1.36	0.0	28,269,132	267.37	20.84	488.7	1,634,104
08/22/1999	0:30	3,856	306.89	1.36	0.0	28,269,132	267.37	20.84	488.7	1,638,991
08/22/1999	0:40	3,866	306.88	1.37	0.0	28,269,132	267.33	20.88	488.7	1,643,879
08/22/1999	0:50	3,876	306.88	1.37	0.0	28,269,132	267.31	20.90	488.7	1,648,766
08/22/1999	1:00	3,886	306.89	1.36	0.0	28,269,132	267.36	20.85	488.7	1,653,653
08/22/1999	1:10	3,896	306.89	1.36	0.0	28,269,132	267.32	20.89	488.7	1,658,541
08/22/1999	1:20	3,906	306.89	1.36	0.0	28,269,132	267.32	20.89	488.7	1,663,428
08/22/1999	1:30	3,916	306.88	1.37	0.0	28,269,132	267.37	20.84	488.7	1,668,316
08/22/1999	1:40	3,926	306.88	1.37	0.0	28,269,132	267.34	20.88	488.7	1,673,203
08/22/1999	1:50	3,936	306.86	1.38	0.0	28,269,132	267.31	20.90	488.7	1,678,091
08/22/1999	2:00	3,946	306.88	1.37	0.0	28,269,132	267.39	20.83	488.7	1,682,978
08/22/1999	2:10	3,956	306.86	1.38	0.0	28,269,132	267.34	20.87	488.7	1,687,866
08/22/1999	2:20	3,966	306.88	1.37	0.0	28,269,132	267.32	20.89	488.7	1,692,753
08/22/1999	2:30	3,976	306.86	1.38	0.0	28,269,132	267.38	20.83	488.7	1,697,641
08/22/1999	2:40	3,986	306.86	1.38	0.0	28,269,132	267.37	20.84	488.7	1,702,528
08/22/1999	2:50	3,996	306.86	1.38	0.0	28,269,132	267.34	20.87	488.7	1,707,416
08/22/1999	3:00	4,006	306.86	1.38	0.0	28,269,132	267.36	20.85	488.7	1,712,303
08/22/1999	3:10	4,016	306.85	1.40	0.0	28,269,132	267.37	20.84	488.7	1,717,191
08/22/1999	3:20	4,026	306.86	1.38	0.0	28,269,132	267.35	20.86	488.7	1,722,078
08/22/1999	3:30	4,036	306.85	1.40	0.0	28,269,132	267.33	20.88	488.7	1,726,965
08/22/1999	3:40	4,046	306.85	1.40	0.0	28,269,132	267.38	20.83	488.7	1,731,853
08/22/1999	3:50	4,056	306.85	1.40	0.0	28,269,132	267.36	20.85	488.7	1,736,740
08/22/1999	4:00	4,066	306.85	1.40	0.0	28,269,132	267.34	20.87	488.7	1,741,628
08/22/1999	4:10	4,076	306.85	1.40	0.0	28,269,132	267.39	20.82	488.7	1,746,515

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/22/1999	4:20	4,086	306.86	1.38	0.0	28,269,132	267.38	20.83	488.7	1,751,403
08/22/1999	4:30	4,096	306.84	1.41	0.0	28,269,132	267.35	20.86	488.7	1,756,290
08/22/1999	4:40	4,106	306.84	1.41	0.0	28,269,132	267.37	20.85	488.7	1,761,178
08/22/1999	4:50	4,116	306.84	1.41	0.0	28,269,132	267.40	20.81	488.7	1,766,065
08/22/1999	5:00	4,126	306.84	1.41	0.0	28,269,132	267.37	20.84	488.7	1,770,953
08/22/1999	5:10	4,136	306.84	1.41	0.0	28,269,132	267.35	20.86	488.7	1,775,840
08/22/1999	5:20	4,146	306.84	1.41	0.0	28,269,132	267.38	20.83	488.7	1,780,728
08/22/1999	5:30	4,156	306.82	1.43	0.0	28,269,132	267.39	20.82	488.7	1,785,615
08/22/1999	5:40	4,166	306.84	1.41	0.0	28,269,132	267.38	20.83	488.7	1,790,503
08/22/1999	5:50	4,176	306.84	1.41	0.0	28,269,132	267.36	20.85	488.7	1,795,390
08/22/1999	6:00	4,186	306.84	1.41	0.0	28,269,132	267.42	20.79	488.7	1,800,277
08/22/1999	6:10	4,196	306.82	1.43	0.0	28,269,132	267.38	20.83	488.7	1,805,165
08/22/1999	6:20	4,206	306.82	1.43	0.0	28,269,132	267.36	20.85	488.7	1,810,052
08/22/1999	6:30	4,216	306.82	1.43	0.0	28,269,132	267.40	20.81	488.7	1,814,940
08/22/1999	6:40	4,226	306.82	1.43	0.0	28,269,132	267.41	20.80	488.7	1,819,827
08/22/1999	6:50	4,236	306.81	1.44	0.0	28,269,132	267.37	20.84	488.7	1,824,715
08/22/1999	7:00	4,246	306.81	1.44	0.0	28,269,132	267.37	20.84	488.7	1,829,602
08/22/1999	7:10	4,256	306.82	1.43	0.0	28,269,132	267.41	20.80	488.7	1,834,490
08/22/1999	7:20	4,266	306.81	1.44	0.0	28,269,132	267.39	20.82	488.7	1,839,377
08/22/1999	7:30	4,276	306.82	1.43	0.0	28,269,132	267.37	20.84	488.7	1,844,265
08/22/1999	7:40	4,286	306.82	1.43	0.0	28,269,132	267.36	20.85	488.7	1,849,152
08/22/1999	7:50	4,296	306.79	1.46	0.0	28,269,132	267.41	20.80	488.7	1,854,040
08/22/1999	8:00	4,306	306.81	1.44	0.0	28,269,132	267.38	20.83	488.7	1,858,927
08/22/1999	8:10	4,316	306.79	1.46	0.0	28,269,132	267.35	20.86	488.7	1,863,815
08/22/1999	8:20	4,326	306.79	1.46	0.0	28,269,132	267.42	20.80	488.7	1,868,702
08/22/1999	8:30	4,336	306.79	1.46	0.0	28,269,132	267.38	20.83	488.7	1,873,590
08/22/1999	8:40	4,346	306.79	1.46	0.0	28,269,132	267.36	20.85	485.1	1,878,440
08/22/1999	8:50	4,356	306.79	1.46	0.0	28,269,132	267.39	20.82	485.1	1,883,291
08/22/1999	9:00	4,366	306.79	1.46	0.0	28,269,132	267.41	20.80	485.1	1,888,141
08/22/1999	9:10	4,376	306.79	1.46	0.0	28,269,132	267.37	20.84	485.1	1,892,992
08/22/1999	9:20	4,386	306.79	1.46	0.0	28,269,132	267.35	20.87	485.1	1,897,842
08/22/1999	9:30	4,396	306.79	1.46	0.0	28,269,132	267.41	20.80	485.1	1,902,693
08/22/1999	9:40	4,406	306.79	1.46	0.0	28,269,132	267.38	20.83	485.1	1,907,543
08/22/1999	9:50	4,416	306.78	1.47	0.0	28,269,132	267.35	20.86	485.1	1,912,394
08/22/1999	10:00	4,426	306.78	1.47	0.0	28,269,132	267.38	20.83	485.1	1,917,245
08/22/1999	10:10	4,436	306.79	1.46	0.0	28,269,132	267.40	20.82	485.1	1,922,095
08/22/1999	10:20	4,446	306.81	1.44	0.0	28,269,132	267.36	20.85	485.1	1,926,946
08/22/1999	10:30	4,456	306.76	1.49	0.0	28,269,132	267.34	20.87	485.1	1,931,796
08/22/1999	10:40	4,466	306.76	1.49	0.0	28,269,132	267.41	20.80	485.1	1,936,647
08/22/1999	10:50	4,476	306.78	1.47	0.0	28,269,132	267.36	20.85	485.1	1,941,497
08/22/1999	11:00	4,486	306.76	1.49	0.0	28,269,132	267.35	20.86	485.1	1,946,348
08/22/1999	11:10	4,496	306.76	1.49	0.0	28,269,132	267.40	20.81	485.1	1,951,198
08/22/1999	11:20	4,506	306.78	1.47	0.0	28,269,132	267.39	20.82	485.1	1,956,049
08/22/1999	11:30	4,516	306.78	1.47	0.0	28,269,132	267.36	20.85	485.1	1,960,900
08/22/1999	11:40	4,526	306.78	1.47	0.0	28,269,132	267.40	20.81	485.1	1,965,750
08/22/1999	11:50	4,536	306.76	1.49	0.0	28,269,132	267.38	20.83	485.1	1,970,601
08/22/1999	12:00	4,546	306.76	1.49	0.0	28,269,132	267.35	20.86	485.1	1,975,451
08/22/1999	12:10	4,556	306.76	1.49	0.0	28,269,132	267.35	20.86	485.1	1,980,302
08/22/1999	12:20	4,566	306.76	1.49	0.0	28,269,132	267.42	20.79	485.1	1,985,152
08/22/1999	12:30	4,576	306.75	1.50	0.0	28,269,132	267.36	20.85	485.1	1,990,003
08/22/1999	12:40	4,586	306.75	1.50	0.0	28,269,132	267.35	20.86	485.1	1,994,853
08/22/1999	12:50	4,596	306.75	1.50	0.0	28,269,132	267.36	20.85	485.1	1,999,704
08/22/1999	13:00	4,606	306.76	1.49	0.0	28,269,132	267.39	20.82	485.1	2,004,555
08/22/1999	13:10	4,616	306.75	1.50	0.0	28,269,132	267.35	20.86	485.1	2,009,405
08/22/1999	13:20	4,626	306.76	1.49	0.0	28,269,132	267.35	20.86	485.1	2,014,256
08/22/1999	13:30	4,636	306.75	1.50	0.0	28,269,132	267.38	20.83	485.1	2,019,106
08/22/1999	13:40	4,646	306.75	1.50	0.0	28,269,132	267.36	20.86	485.1	2,023,957
08/22/1999	13:50	4,656	306.75	1.50	0.0	28,269,132	267.34	20.87	485.1	2,028,807
08/22/1999	14:00	4,666	306.75	1.50	0.0	28,269,132	267.40	20.81	485.1	2,033,658

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/22/1999	14:10	4,676	306.75	1.50	0.0	28,269,132	267.38	20.83	485.1	2,038,508
08/22/1999	14:20	4,686	306.75	1.50	0.0	28,269,132	267.34	20.87	485.1	2,043,359
08/22/1999	14:30	4,696	306.75	1.50	0.0	28,269,132	267.37	20.85	485.1	2,048,210
08/22/1999	14:40	4,706	306.76	1.49	0.0	28,269,132	267.39	20.83	485.1	2,053,060
08/22/1999	14:50	4,716	306.75	1.50	0.0	28,269,132	267.36	20.85	485.1	2,057,911
08/22/1999	15:00	4,726	306.75	1.50	0.0	28,269,132	267.34	20.87	485.1	2,062,761
08/22/1999	15:10	4,736	306.75	1.50	0.0	28,269,132	267.38	20.83	485.1	2,067,612
08/22/1999	15:20	4,746	306.73	1.51	0.0	28,269,132	267.37	20.84	485.1	2,072,462
08/22/1999	15:30	4,756	306.75	1.50	0.0	28,269,132	267.36	20.85	485.1	2,077,313
08/22/1999	15:40	4,766	306.73	1.51	0.0	28,269,132	267.39	20.83	485.1	2,082,163
08/22/1999	15:50	4,776	306.73	1.51	0.0	28,269,132	267.37	20.84	485.1	2,087,014
08/22/1999	16:00	4,786	306.73	1.51	0.0	28,269,132	267.37	20.84	485.1	2,091,865
08/22/1999	16:10	4,796	306.73	1.51	0.0	28,269,132	267.40	20.81	485.1	2,096,715
08/22/1999	16:20	4,806	306.73	1.51	0.0	28,269,132	267.38	20.83	485.1	2,101,566
08/22/1999	16:30	4,816	306.73	1.51	0.0	28,269,132	267.35	20.86	485.1	2,106,416
08/22/1999	16:40	4,826	306.73	1.51	0.0	28,269,132	267.41	20.80	485.1	2,111,267
08/22/1999	16:50	4,836	306.71	1.54	0.0	28,269,132	267.38	20.83	485.1	2,116,117
08/22/1999	17:00	4,846	306.73	1.51	0.0	28,269,132	267.37	20.84	485.1	2,120,968
08/22/1999	17:10	4,856	306.73	1.51	0.0	28,269,132	267.42	20.79	485.1	2,125,818
08/22/1999	17:20	4,866	306.72	1.53	0.0	28,269,132	267.39	20.82	485.1	2,130,669
08/22/1999	17:30	4,876	306.71	1.54	0.0	28,269,132	267.36	20.85	485.1	2,135,520
08/22/1999	17:40	4,886	306.72	1.53	0.0	28,269,132	267.44	20.77	485.1	2,140,370
08/22/1999	17:50	4,896	306.73	1.51	0.0	28,269,132	267.41	20.81	485.1	2,145,221
08/22/1999	18:00	4,906	306.71	1.54	0.0	28,269,132	267.37	20.84	485.1	2,150,071
08/22/1999	18:10	4,916	306.71	1.54	0.0	28,269,132	267.41	20.81	485.1	2,154,922
08/22/1999	18:20	4,926	306.72	1.53	0.0	28,269,132	267.40	20.81	485.1	2,159,772
08/22/1999	18:30	4,936	306.71	1.54	0.0	28,269,132	267.36	20.85	485.1	2,164,623
08/22/1999	18:40	4,946	306.71	1.54	0.0	28,269,132	267.41	20.80	485.1	2,169,473
08/22/1999	18:50	4,956	306.72	1.53	0.0	28,269,132	267.39	20.82	485.1	2,174,324
08/22/1999	19:00	4,966	306.71	1.54	0.0	28,269,132	267.38	20.83	485.1	2,179,175
08/22/1999	19:10	4,976	306.71	1.54	0.0	28,269,132	267.43	20.78	485.1	2,184,025
08/22/1999	19:20	4,986	306.69	1.56	0.0	28,269,132	267.39	20.82	485.1	2,188,876
08/22/1999	19:30	4,996	306.71	1.54	0.0	28,269,132	267.39	20.82	485.1	2,193,726
08/22/1999	19:40	5,006	306.73	1.51	0.0	28,269,132	267.43	20.78	485.1	2,198,577
08/22/1999	19:50	5,016	306.69	1.56	0.0	28,269,132	267.39	20.82	485.1	2,203,427
08/22/1999	20:00	5,026	306.69	1.56	0.0	28,269,132	267.37	20.84	485.1	2,208,278
08/22/1999	20:10	5,036	306.69	1.56	0.0	28,269,132	267.42	20.79	485.1	2,213,128
08/22/1999	20:20	5,046	306.69	1.56	0.0	28,269,132	267.40	20.81	485.1	2,217,979
08/22/1999	20:30	5,056	306.69	1.56	0.0	28,269,132	267.38	20.83	485.1	2,222,830
08/22/1999	20:40	5,066	306.71	1.54	0.0	28,269,132	267.44	20.77	485.1	2,227,680
08/22/1999	20:50	5,076	306.69	1.56	0.0	28,269,132	267.40	20.81	485.1	2,232,531
08/22/1999	21:00	5,086	306.68	1.57	0.0	28,269,132	267.39	20.82	485.1	2,237,381
08/22/1999	21:10	5,096	306.69	1.56	0.0	28,269,132	267.44	20.77	485.1	2,242,232
08/22/1999	21:20	5,106	306.69	1.56	0.0	28,269,132	267.40	20.81	485.1	2,247,082
08/22/1999	21:30	5,116	306.69	1.56	0.0	28,269,132	267.41	20.80	485.1	2,251,933
08/22/1999	21:40	5,126	306.69	1.56	0.0	28,269,132	267.42	20.79	485.1	2,256,783
08/22/1999	21:50	5,136	306.69	1.56	0.0	28,269,132	267.40	20.81	485.1	2,261,634
08/22/1999	22:00	5,146	306.69	1.56	0.0	28,269,132	267.42	20.79	485.1	2,266,485
08/22/1999	22:10	5,156	306.69	1.56	0.0	28,269,132	267.42	20.79	485.1	2,271,335
08/22/1999	22:20	5,166	306.69	1.56	0.0	28,269,132	267.41	20.80	485.1	2,276,186
08/22/1999	22:30	5,176	306.68	1.57	0.0	28,269,132	267.42	20.79	485.1	2,281,036
08/22/1999	22:40	5,186	306.68	1.57	0.0	28,269,132	267.40	20.81	485.1	2,285,887
08/22/1999	22:50	5,196	306.69	1.56	0.0	28,269,132	267.39	20.83	485.1	2,290,737
08/22/1999	23:00	5,206	306.68	1.57	0.0	28,269,132	267.43	20.78	485.1	2,295,588
08/22/1999	23:10	5,216	306.68	1.57	0.0	28,269,132	267.41	20.80	485.1	2,300,438
08/22/1999	23:20	5,226	306.68	1.57	0.0	28,269,132	267.39	20.82	485.1	2,305,289
08/22/1999	23:30	5,236	306.68	1.57	0.0	28,269,132	267.44	20.77	485.1	2,310,140
08/22/1999	23:40	5,246	306.68	1.57	0.0	28,269,132	267.41	20.80	485.1	2,314,990
08/22/1999	23:50	5,256	306.66	1.59	0.0	28,269,132	267.39	20.82	485.1	2,319,841

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/23/1999	0:00	5,266	306.68	1.57	0.0	28,269,132	267.45	20.76	485.1	2,324,691
08/23/1999	0:10	5,276	306.66	1.59	0.0	28,269,132	267.41	20.80	485.1	2,329,542
08/23/1999	0:20	5,286	306.68	1.57	0.0	28,269,132	267.40	20.81	485.1	2,334,392
08/23/1999	0:30	5,296	306.66	1.59	0.0	28,269,132	267.44	20.77	485.1	2,339,243
08/23/1999	0:40	5,306	306.68	1.57	0.0	28,269,132	267.42	20.79	485.1	2,344,093
08/23/1999	0:50	5,316	306.66	1.59	0.0	28,269,132	267.39	20.82	485.1	2,348,944
08/23/1999	1:00	5,326	306.66	1.59	0.0	28,269,132	267.44	20.77	485.1	2,353,795
08/23/1999	1:10	5,336	306.68	1.57	0.0	28,269,132	267.42	20.79	485.1	2,358,645
08/23/1999	1:20	5,346	306.66	1.59	0.0	28,269,132	267.39	20.82	485.1	2,363,496
08/23/1999	1:30	5,356	306.66	1.59	0.0	28,269,132	267.42	20.79	485.1	2,368,346
08/23/1999	1:40	5,366	306.68	1.57	0.0	28,269,132	267.42	20.79	485.1	2,373,197
08/23/1999	1:50	5,376	306.66	1.59	0.0	28,269,132	267.40	20.82	485.1	2,378,047
08/23/1999	2:00	5,386	306.66	1.59	0.0	28,269,132	267.37	20.84	485.1	2,382,898
08/23/1999	2:10	5,396	306.65	1.60	0.0	28,269,132	267.42	20.79	485.1	2,387,749
08/23/1999	2:20	5,406	306.66	1.59	0.0	28,269,132	267.41	20.80	485.1	2,392,599
08/23/1999	2:30	5,416	306.65	1.60	0.0	28,269,132	267.38	20.83	485.1	2,397,450
08/23/1999	2:40	5,426	306.65	1.60	0.0	28,269,132	267.44	20.77	485.1	2,402,300
08/23/1999	2:50	5,436	306.66	1.59	0.0	28,269,132	267.41	20.80	485.1	2,407,151
08/23/1999	3:00	5,446	306.65	1.60	0.0	28,269,132	267.39	20.82	485.1	2,412,001
08/23/1999	3:10	5,456	306.65	1.60	0.0	28,269,132	267.44	20.77	485.1	2,416,852
08/23/1999	3:20	5,466	306.65	1.60	0.0	28,269,132	267.42	20.79	485.1	2,421,702
08/23/1999	3:30	5,476	306.66	1.59	0.0	28,269,132	267.41	20.80	485.1	2,426,553
08/23/1999	3:40	5,486	306.65	1.60	0.0	28,269,132	267.40	20.82	485.1	2,431,404
08/23/1999	3:50	5,496	306.65	1.60	0.0	28,269,132	267.46	20.75	485.1	2,436,254
08/23/1999	4:00	5,506	306.65	1.60	0.0	28,269,132	267.42	20.79	485.1	2,441,105
08/23/1999	4:10	5,516	306.65	1.60	0.0	28,269,132	267.40	20.81	485.1	2,445,955
08/23/1999	4:20	5,526	306.65	1.60	0.0	28,269,132	267.40	20.81	485.1	2,450,806
08/23/1999	4:30	5,536	306.65	1.60	0.0	28,269,132	267.38	20.83	485.1	2,455,656
08/23/1999	4:40	5,546	306.65	1.60	0.0	28,269,132	267.35	20.86	485.1	2,460,507
08/23/1999	4:50	5,556	306.63	1.62	0.0	28,269,132	267.34	20.87	485.1	2,465,357
08/23/1999	5:00	5,566	306.65	1.60	0.0	28,269,132	267.41	20.80	485.1	2,470,208
08/23/1999	5:10	5,576	306.65	1.60	0.0	28,269,132	267.37	20.85	485.1	2,475,059
08/23/1999	5:20	5,586	306.65	1.60	0.0	28,269,132	267.35	20.86	485.1	2,479,909
08/23/1999	5:30	5,596	306.63	1.62	0.0	28,269,132	267.36	20.85	485.1	2,484,760
08/23/1999	5:40	5,606	306.63	1.62	0.0	28,269,132	267.38	20.83	485.1	2,489,610
08/23/1999	5:50	5,616	306.65	1.60	0.0	28,269,132	267.37	20.84	485.1	2,494,461
08/23/1999	6:00	5,626	306.65	1.60	0.0	28,269,132	267.36	20.85	485.1	2,499,311
08/23/1999	6:10	5,636	306.63	1.62	0.0	28,269,132	267.43	20.78	485.1	2,504,162
08/23/1999	6:20	5,646	306.63	1.62	0.0	28,269,132	267.40	20.81	485.1	2,509,012
08/23/1999	6:30	5,656	306.63	1.62	0.0	28,269,132	267.39	20.82	485.1	2,513,863
08/23/1999	6:40	5,666	306.63	1.62	0.0	28,269,132	267.37	20.84	485.1	2,518,714
08/23/1999	6:50	5,676	306.63	1.62	0.0	28,269,132	267.46	20.75	485.1	2,523,564
08/23/1999	7:00	5,686	306.63	1.62	0.0	28,269,132	267.42	20.80	485.1	2,528,415
08/23/1999	7:10	5,696	306.63	1.62	0.0	28,269,132	267.40	20.81	485.1	2,533,265
08/23/1999	7:20	5,706	306.60	1.64	0.0	28,269,132	267.38	20.83	485.1	2,538,116
08/23/1999	7:30	5,716	306.62	1.63	0.0	28,269,132	267.46	20.75	485.1	2,542,966
08/23/1999	7:40	5,726	306.60	1.64	0.0	28,269,132	267.42	20.80	485.1	2,547,817
08/23/1999	7:50	5,736	306.60	1.64	0.0	28,269,132	267.40	20.81	485.1	2,552,667
08/23/1999	8:00	5,746	306.63	1.62	0.0	28,269,132	267.39	20.83	485.1	2,557,518
08/23/1999	8:10	5,756	306.59	1.66	0.0	28,269,132	267.43	20.78	485.1	2,562,369
08/23/1999	8:20	5,766	306.60	1.64	0.0	28,269,132	267.40	20.81	485.1	2,567,219
08/23/1999	8:30	5,776	306.60	1.64	0.0	28,269,132	267.38	20.83	466.6	2,571,885
08/23/1999	8:40	5,786	306.62	1.63	0.0	28,269,132	267.39	20.82	466.6	2,576,551
08/23/1999	8:50	5,796	306.62	1.63	0.0	28,269,132	267.44	20.77	466.6	2,581,217
08/23/1999	9:00	5,806	306.62	1.63	0.0	28,269,132	267.45	20.77	466.6	2,585,884
08/23/1999	9:10	5,816	306.60	1.64	0.0	28,269,132	267.47	20.74	466.6	2,590,550
08/23/1999	9:20	5,826	306.60	1.64	0.0	28,269,132	267.47	20.74	466.6	2,595,216
08/23/1999	9:30	5,836	306.60	1.64	0.0	28,269,132	267.45	20.76	466.6	2,599,882
08/23/1999	9:40	5,846	306.59	1.66	0.0	28,269,132	267.44	20.77	466.6	2,604,548

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/23/1999	9:50	5,856	306.62	1.63	0.0	28,269,132	267.55	20.66	466.6	2,609,214
08/23/1999	10:00	5,866	306.63	1.62	0.0	28,269,132	0.00	0.00	466.6	2,613,880
08/23/1999	10:10	5,876	306.66	1.59	0.0	28,269,132	0.00	0.00	466.6	2,618,546
08/23/1999	10:20	5,886	306.69	1.56	0.0	28,269,132	0.00	0.00	466.6	2,623,213
08/23/1999	10:30	5,896	306.69	1.56	0.0	28,269,132	0.00	0.00	466.6	2,627,879
08/23/1999	10:40	5,906	306.56	1.69	279.5	28,271,927	0.00	0.00	466.6	2,632,545
08/23/1999	10:50	5,916	300.77	7.48	279.5	28,274,721	0.00	0.00	466.6	2,637,211
08/23/1999	11:00	5,926	300.49	7.76	279.5	28,277,516	0.00	0.00	466.6	2,641,877
08/23/1999	11:10	5,936	300.68	7.57	279.5	28,280,310	266.61	21.60	466.6	2,646,543
08/23/1999	11:20	5,946	300.02	8.23	279.5	28,283,105	266.51	21.70	466.6	2,651,209
08/23/1999	11:30	5,956	300.32	7.93	279.5	28,285,899	266.66	21.55	466.6	2,655,875
08/23/1999	11:40	5,966	300.20	8.05	279.5	28,288,694	266.54	21.67	466.6	2,660,542
08/23/1999	11:50	5,976	300.07	8.18	279.5	28,291,488	266.75	21.46	466.6	2,665,208
08/23/1999	12:00	5,986	300.32	7.93	279.5	28,294,283	266.76	21.45	466.6	2,669,874
08/23/1999	12:10	5,996	300.33	7.92	279.5	28,297,077	266.80	21.41	466.6	2,674,540
08/23/1999	12:20	6,006	300.45	7.80	279.5	28,299,872	266.92	21.29	466.6	2,679,206
08/23/1999	12:30	6,016	300.28	7.97	279.5	28,302,666	267.02	21.19	466.6	2,683,872
08/23/1999	12:40	6,026	299.96	8.29	279.5	28,305,461	266.92	21.29	466.6	2,688,538
08/23/1999	12:50	6,036	300.05	8.20	279.5	28,308,255	266.87	21.35	466.6	2,693,204
08/23/1999	13:00	6,046	299.97	8.28	279.5	28,311,050	266.62	21.59	466.6	2,697,871
08/23/1999	13:10	6,056	300.06	8.19	279.5	28,313,844	266.96	21.25	466.6	2,702,537
08/23/1999	13:20	6,066	299.92	8.33	279.5	28,316,639	266.83	21.38	466.6	2,707,203
08/23/1999	13:30	6,076	299.90	8.35	279.5	28,319,434	266.82	21.39	466.6	2,711,869
08/23/1999	13:40	6,086	300.00	8.25	279.5	28,322,228	267.11	21.10	466.6	2,716,535
08/23/1999	13:50	6,096	299.77	8.48	279.5	28,325,023	267.14	21.07	466.6	2,721,201
08/23/1999	14:00	6,106	299.93	8.32	279.5	28,327,817	266.96	21.25	466.6	2,725,867
08/23/1999	14:10	6,116	299.90	8.35	279.5	28,330,612	267.20	21.01	466.6	2,730,533
08/23/1999	14:20	6,126	299.68	8.56	279.5	28,333,406	267.08	21.13	466.6	2,735,200
08/23/1999	14:30	6,136	299.67	8.58	279.5	28,336,201	266.97	21.24	466.6	2,739,866
08/23/1999	14:40	6,146	299.67	8.58	279.5	28,338,995	266.96	21.25	466.6	2,744,532
08/23/1999	14:50	6,156	299.83	8.42	279.5	28,341,790	266.32	21.89	466.6	2,749,198
08/23/1999	15:00	6,166	299.71	8.54	279.5	28,344,584	266.37	21.84	466.6	2,753,864
08/23/1999	15:10	6,176	299.48	8.77	279.5	28,347,379	266.36	21.85	466.6	2,758,530
08/23/1999	15:20	6,186	299.74	8.51	279.5	28,350,173	266.13	22.08	466.6	2,763,196
08/23/1999	15:30	6,196	299.67	8.58	279.5	28,352,968	266.16	22.05	466.6	2,767,862
08/23/1999	15:40	6,206	299.71	8.54	279.5	28,355,762	266.24	21.97	466.6	2,772,528
08/23/1999	15:50	6,216	299.67	8.58	279.5	28,358,557	266.11	22.10	466.6	2,777,195
08/23/1999	16:00	6,226	299.66	8.59	279.5	28,361,351	266.37	21.84	466.6	2,781,861
08/23/1999	16:10	6,236	299.50	8.75	279.5	28,364,146	266.14	22.08	466.6	2,786,527
08/23/1999	16:20	6,246	299.54	8.71	279.5	28,366,941	266.44	21.77	466.6	2,791,193
08/23/1999	16:30	6,256	299.38	8.87	279.5	28,369,735	266.28	21.93	466.6	2,795,859
08/23/1999	16:40	6,266	299.66	8.59	279.5	28,372,530	266.18	22.03	466.6	2,800,525
08/23/1999	16:50	6,276	299.40	8.85	279.5	28,375,324	266.01	22.20	466.6	2,805,191
08/23/1999	17:00	6,286	299.44	8.81	279.5	28,378,119	266.00	22.21	466.6	2,809,857
08/23/1999	17:10	6,296	299.48	8.77	279.5	28,380,913	265.96	22.26	466.6	2,814,524
08/23/1999	17:20	6,306	299.73	8.52	279.5	28,383,708	266.14	22.07	466.6	2,819,190
08/23/1999	17:30	6,316	299.31	8.94	279.5	28,386,502	266.24	21.97	466.6	2,823,856
08/23/1999	17:40	6,326	299.70	8.55	279.5	28,389,297	266.29	21.92	466.6	2,828,522
08/23/1999	17:50	6,336	299.19	9.05	279.5	28,392,091	266.35	21.86	466.6	2,833,188
08/23/1999	18:00	6,346	299.04	9.21	279.5	28,394,886	266.01	22.20	466.6	2,837,854
08/23/1999	18:10	6,356	299.40	8.85	279.5	28,397,680	266.09	22.12	466.6	2,842,520
08/23/1999	18:20	6,366	299.48	8.77	279.5	28,400,475	265.98	22.24	466.6	2,847,186
08/23/1999	18:30	6,376	299.25	9.00	279.5	28,403,269	265.98	22.23	466.6	2,851,853
08/23/1999	18:40	6,386	299.43	8.82	279.5	28,406,064	266.12	22.09	466.6	2,856,519
08/23/1999	18:50	6,396	299.32	8.92	279.5	28,408,858	266.01	22.20	466.6	2,861,185
08/23/1999	19:00	6,406	299.15	9.10	279.5	28,411,653	266.13	22.08	466.6	2,865,851
08/23/1999	19:10	6,416	299.11	9.14	279.5	28,414,448	266.26	21.95	466.6	2,870,517
08/23/1999	19:20	6,426	299.44	8.81	279.5	28,417,242	266.03	22.19	466.6	2,875,183
08/23/1999	19:30	6,436	299.28	8.97	279.5	28,420,037	266.02	22.19	466.6	2,879,849

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/23/1999	19:40	6,446	299.32	8.92	279.5	28,422,831	265.82	22.39	466.6	2,884,515
08/23/1999	19:50	6,456	299.15	9.10	279.5	28,425,626	266.16	22.06	466.6	2,889,182
08/23/1999	20:00	6,466	298.79	9.46	279.5	28,428,420	266.07	22.15	466.6	2,893,848
08/23/1999	20:10	6,476	298.98	9.27	279.5	28,431,215	266.21	22.00	466.6	2,898,514
08/23/1999	20:20	6,486	299.12	9.13	279.5	28,434,009	266.28	21.93	466.6	2,903,180
08/23/1999	20:30	6,496	299.04	9.21	279.5	28,436,804	266.30	21.92	466.6	2,907,846
08/23/1999	20:40	6,506	298.91	9.34	279.5	28,439,598	266.26	21.95	466.6	2,912,512
08/23/1999	20:50	6,516	299.31	8.94	279.5	28,442,393	266.35	21.86	466.6	2,917,178
08/23/1999	21:00	6,526	299.21	9.04	279.5	28,445,187	265.94	22.27	466.6	2,921,844
08/23/1999	21:10	6,536	298.88	9.37	279.5	28,447,982	265.98	22.23	466.6	2,926,511
08/23/1999	21:20	6,546	298.75	9.50	279.5	28,450,776	266.29	21.92	466.6	2,931,177
08/23/1999	21:30	6,556	298.81	9.44	279.5	28,453,571	266.17	22.04	466.6	2,935,843
08/23/1999	21:40	6,566	299.01	9.24	279.5	28,456,365	265.80	22.41	466.6	2,940,509
08/23/1999	21:50	6,576	298.92	9.33	279.5	28,459,160	266.00	22.21	466.6	2,945,175
08/23/1999	22:00	6,586	298.63	9.62	279.5	28,461,955	266.05	22.16	466.6	2,949,841
08/23/1999	22:10	6,596	298.75	9.50	279.5	28,464,749	266.25	21.96	466.6	2,954,507
08/23/1999	22:20	6,606	298.89	9.36	279.5	28,467,544	265.78	22.43	466.6	2,959,173
08/23/1999	22:30	6,616	298.69	9.56	279.5	28,470,338	265.91	22.30	466.6	2,963,840
08/23/1999	22:40	6,626	298.85	9.40	279.5	28,473,133	265.84	22.37	466.6	2,968,506
08/23/1999	22:50	6,636	299.08	9.17	279.5	28,475,927	266.06	22.15	466.6	2,973,172
08/23/1999	23:00	6,646	298.95	9.30	279.5	28,478,722	265.92	22.29	466.6	2,977,838
08/23/1999	23:10	6,656	298.75	9.50	279.5	28,481,516	265.89	22.32	466.6	2,982,504
08/23/1999	23:20	6,666	298.65	9.60	279.5	28,484,311	265.80	22.41	466.6	2,987,170
08/23/1999	23:30	6,676	298.60	9.64	279.5	28,487,105	266.05	22.16	466.6	2,991,836
08/23/1999	23:40	6,686	299.08	9.17	279.5	28,489,900	266.00	22.21	466.6	2,996,502
08/23/1999	23:50	6,696	298.53	9.72	279.5	28,492,694	265.98	22.24	466.6	3,001,168
08/24/1999	0:00	6,706	298.68	9.57	279.5	28,495,489	266.00	22.21	466.6	3,005,835
08/24/1999	0:10	6,716	298.63	9.62	279.5	28,498,283	265.71	22.50	466.6	3,010,501
08/24/1999	0:20	6,726	298.50	9.75	279.5	28,501,078	265.87	22.34	466.6	3,015,167
08/24/1999	0:30	6,736	298.52	9.73	279.5	28,503,872	265.99	22.22	466.6	3,019,833
08/24/1999	0:40	6,746	298.52	9.73	279.5	28,506,667	265.83	22.38	466.6	3,024,499
08/24/1999	0:50	6,756	298.79	9.46	279.5	28,509,461	265.66	22.55	466.6	3,029,165
08/24/1999	1:00	6,766	298.33	9.92	279.5	28,512,256	265.61	22.60	466.6	3,033,831
08/24/1999	1:10	6,776	298.56	9.69	279.5	28,515,051	265.98	22.23	466.6	3,038,497
08/24/1999	1:20	6,786	298.79	9.46	279.5	28,517,845	265.97	22.25	466.6	3,043,164
08/24/1999	1:30	6,796	298.76	9.49	279.5	28,520,640	265.87	22.34	466.6	3,047,830
08/24/1999	1:40	6,806	298.63	9.62	279.5	28,523,434	265.91	22.30	466.6	3,052,496
08/24/1999	1:50	6,816	298.44	9.80	279.5	28,526,229	265.79	22.42	466.6	3,057,162
08/24/1999	2:00	6,826	298.42	9.83	279.5	28,529,023	266.03	22.18	466.6	3,061,828
08/24/1999	2:10	6,836	298.62	9.63	279.5	28,531,818	266.11	22.10	466.6	3,066,494
08/24/1999	2:20	6,846	298.30	9.95	279.5	28,534,612	265.96	22.25	466.6	3,071,160
08/24/1999	2:30	6,856	298.40	9.85	279.5	28,537,407	265.94	22.27	466.6	3,075,826
08/24/1999	2:40	6,866	298.47	9.77	279.5	28,540,201	265.92	22.29	466.6	3,080,493
08/24/1999	2:50	6,876	298.70	9.54	279.5	28,542,996	265.94	22.27	466.6	3,085,159
08/24/1999	3:00	6,886	298.40	9.85	279.5	28,545,790	265.63	22.58	466.6	3,089,825
08/24/1999	3:10	6,896	298.21	10.03	279.5	28,548,585	265.63	22.58	466.6	3,094,491
08/24/1999	3:20	6,906	298.57	9.67	279.5	28,551,379	265.73	22.48	466.6	3,099,157
08/24/1999	3:30	6,916	298.36	9.89	279.5	28,554,174	265.48	22.73	466.6	3,103,823
08/24/1999	3:40	6,926	298.50	9.75	279.5	28,556,968	265.64	22.57	466.6	3,108,489
08/24/1999	3:50	6,936	298.47	9.77	279.5	28,559,763	265.74	22.47	466.6	3,113,155
08/24/1999	4:00	6,946	298.55	9.70	279.5	28,562,558	265.94	22.27	466.6	3,117,822
08/24/1999	4:10	6,956	298.545	9.70	279.5	28,565,352	265.78	22.44	466.6	3,122,488
08/24/1999	4:20	6,966	298.098	10.15	279.5	28,568,147	265.58	22.63	466.6	3,127,154
08/24/1999	4:30	6,976	298.329	9.92	279.5	28,570,941	265.56	22.66	466.6	3,131,820
08/24/1999	4:40	6,986	298.603	9.64	279.5	28,573,736	265.45	22.76	466.6	3,136,486
08/24/1999	4:50	6,996	298.603	9.64	279.5	28,576,530	265.63	22.58	466.6	3,141,152
08/24/1999	5:00	7,006	298.502	9.75	279.5	28,579,325	265.63	22.58	466.6	3,145,818
08/24/1999	5:10	7,016	298.286	9.96	279.5	28,582,119	265.76	22.45	466.6	3,150,484
08/24/1999	5:20	7,026	298.199	10.05	279.5	28,584,914	265.82	22.39	466.6	3,155,151

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #3 & Well #4
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/24/1999	5:30	7,036	298.17	10.08	279.5	28,587,708	265.72	22.49	466.6	3,159,817
08/24/1999	5:40	7,046	298.185	10.06	279.5	28,590,503	265.49	22.72	466.6	3,164,483
08/24/1999	5:50	7,056	298.142	10.11	279.5	28,593,297	265.65	22.56	466.6	3,169,149
08/24/1999	6:00	7,066	298.329	9.92	279.5	28,596,092	265.72	22.49	466.6	3,173,815
08/24/1999	6:10	7,076	298.444	9.80	279.5	28,598,886	265.69	22.52	466.6	3,178,481
08/24/1999	6:20	7,086	298.041	10.21	279.5	28,601,681	265.73	22.48	466.6	3,183,147
08/24/1999	6:30	7,096	298.041	10.21	279.5	28,604,475	265.56	22.65	466.6	3,187,813
08/24/1999	6:40	7,106	298.228	10.02	279.5	28,607,270	265.60	22.61	466.6	3,192,480
08/24/1999	6:50	7,116	297.94	10.31	279.5	28,610,065	265.51	22.70	466.6	3,197,146
08/24/1999	7:00	7,126	298.214	10.03	279.5	28,612,859	265.72	22.49	466.6	3,201,812
08/24/1999	7:10	7,136	298.199	10.05	279.5	28,615,654	265.47	22.74	466.6	3,206,478
08/24/1999	7:20	7,146	298.343	9.90	279.5	28,618,448	265.58	22.63	466.6	3,211,144
08/24/1999	7:30	7,156	298.041	10.21	279.5	28,621,243	265.38	22.83	466.6	3,215,810
08/24/1999	7:40	7,166	298.185	10.06	279.5	28,624,037	265.19	23.02	466.6	3,220,476
08/24/1999	7:50	7,176	297.839	10.41	279.5	28,626,832	265.41	22.80	466.6	3,225,142
08/24/1999	8:00	7,186	298.257	9.99	279.5	28,629,626	265.58	22.63	466.6	3,229,808
08/24/1999	8:10	7,196	297.637	10.61	279.5	28,632,421	265.58	22.63	466.6	3,234,475
08/24/1999	8:20	7,206	298.329	9.92	279.5	28,635,215	265.15	23.06	466.6	3,239,141
08/24/1999	8:30	7,216	298.127	10.12	279.5	28,638,010	265.48	22.73	466.6	3,243,807
08/24/1999	8:40	7,226	297.997	10.25	279.5	28,640,804	265.34	22.87	466.6	3,248,473
08/24/1999	8:50	7,236	297.983	10.27	279.5	28,643,599	265.63	22.59	466.6	3,253,139
08/24/1999	9:00	7,246	297.997	10.25	279.5	28,646,393	265.19	23.02	466.6	3,257,805
08/24/1999	9:10	7,256	298.041	10.21	279.5	28,649,188	265.14	23.07	466.6	3,262,471
08/24/1999	9:20	7,266	297.723	10.53	279.5	28,651,982	265.29	22.92	466.6	3,267,137
08/24/1999	9:30	7,276	297.911	10.34	279.5	28,654,777	265.42	22.79	466.6	3,271,804
08/24/1999	9:40	7,286	297.781	10.47	559.1	28,660,368	265.53	22.68	455.8	3,276,362
08/24/1999	9:50	7,296	297.651	10.60	281.5	28,663,183	265.41	22.80	455.8	3,280,920
08/24/1999	10:00	7,306	297.796	10.45	281.5	28,665,997	265.61	22.60	455.8	3,285,478
08/24/1999	10:10	7,316	297.925	10.32	281.5	28,668,812	265.36	22.85	455.8	3,290,037
08/24/1999	10:20	7,326	297.637	10.61	281.5	28,671,627	265.44	22.77	455.8	3,294,595
08/24/1999	10:30	7,336	298.069	10.18	281.5	28,674,441	265.41	22.80	455.8	3,299,153
08/24/1999	10:40	7,346	298.084	10.16	281.5	28,677,256	265.32	22.89	455.8	3,303,711
08/24/1999	10:50	7,356	297.954	10.29	281.5	28,680,071	265.40	22.81	455.8	3,308,270
08/24/1999	11:00	7,366	297.983	10.27	281.5	28,682,885	265.62	22.59	455.8	3,312,828
08/24/1999	11:10	7,376	297.565	10.68	281.5	28,685,700	265.74	22.47	455.8	3,317,386
08/24/1999	11:20	7,386	297.421	10.83	281.5	28,688,515	265.40	22.82	455.8	3,321,944
08/24/1999	11:30	7,396	298.026	10.22	281.5	28,691,329	265.19	23.02	455.8	3,326,503
08/24/1999	11:40	7,406	298.069	10.18	281.5	28,694,144	265.51	22.70	455.8	3,331,061
08/24/1999	11:50	7,416	297.954	10.29	281.5	28,696,959	265.50	22.71	455.8	3,335,619
08/24/1999	12:00	7,426	297.666	10.58	281.5	28,699,773	265.48	22.73	455.8	3,340,177
08/24/1999	12:10	7,436	297.32	10.93	281.5	28,702,588	265.37	22.84	455.8	3,344,736
08/24/1999	12:20	7,446	297.594	10.65	281.5	28,705,403	265.30	22.92	455.8	3,349,294
08/24/1999	12:30	7,456	297.608	10.64	281.5	28,708,217	265.60	22.61	455.8	3,353,852
08/24/1999	12:40	7,466	297.536	10.71	281.5	28,711,032	265.36	22.85	455.8	3,358,410
08/24/1999	12:50	7,476	297.868	10.38	281.5	28,713,847	265.15	23.06	455.8	3,362,969
08/24/1999	13:00	7,486	297.911	10.34	281.5	28,716,661	265.41	22.80	455.8	3,367,527
08/24/1999	13:10	7,496	297.464	10.78	281.5	28,719,476	265.53	22.68	455.8	3,372,085
08/24/1999	13:20	7,506	297.738	10.51	281.5	28,722,290	265.48	22.73	455.8	3,376,643
08/24/1999	13:30	7,516	297.896	10.35	281.5	28,725,105	265.35	22.86	455.8	3,381,202
08/24/1999	13:40	7,526	297.334	10.91	281.5	28,727,920	265.07	23.14	455.8	3,385,760
08/24/1999	13:50	7,536	297.997	10.25	281.5	28,730,734	265.35	22.86	455.8	3,390,318
08/24/1999	14:00	7,546	297.969	10.28	281.5	28,733,549	265.26	22.95	455.8	3,394,876
08/24/1999	14:10	7,556	297.868	10.38	281.5	28,736,364	265.50	22.71	455.8	3,399,435
08/24/1999	14:20	7,566	297.94	10.31	281.5	28,739,178	265.03	23.18	455.8	3,403,993
08/24/1999	14:30	7,576	297.507	10.74	281.5	28,741,993	265.32	22.89	455.8	3,408,551
08/24/1999	14:40	7,586	297.565	10.68	281.5	28,744,808	265.16	23.05	455.8	3,413,109
08/24/1999	14:50	7,596	297.824	10.42	281.5	28,747,622	265.32	22.89	455.8	3,417,668
08/24/1999	15:00	7,606	298.055	10.19	281.5	28,750,437	265.16	23.05	455.8	3,422,226
08/24/1999	15:10	7,616	297.752	10.50	281.5	28,753,252	265.33	22.88	455.8	3,426,784

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/24/1999	15:20	7,626	298.012	10.24	281.5	28,756,066	264.90	23.31	455.8	3,431,343
08/24/1999	15:30	7,636	297.579	10.67	281.5	28,758,881	265.38	22.83	455.8	3,435,901
08/24/1999	15:40	7,646	297.68	10.57	281.5	28,761,696	265.28	22.93	455.8	3,440,459
08/24/1999	15:50	7,656	297.349	10.90	281.5	28,764,510	265.17	23.04	455.8	3,445,017
08/24/1999	16:00	7,666	297.248	11.00	281.5	28,767,325	265.13	23.08	455.8	3,449,576
08/24/1999	16:10	7,676	297.363	10.89	281.5	28,770,140	264.72	23.49	455.8	3,454,134
08/24/1999	16:20	7,686	297.709	10.54	281.5	28,772,954	264.79	23.42	455.8	3,458,692
08/24/1999	16:30	7,696	297.623	10.63	281.5	28,775,769	264.84	23.38	455.8	3,463,250
08/24/1999	16:40	7,706	297.522	10.73	281.5	28,778,583	264.94	23.27	455.8	3,467,809
08/24/1999	16:50	7,716	297.233	11.02	281.5	28,781,398	264.94	23.27	455.8	3,472,367
08/24/1999	17:00	7,726	297.868	10.38	281.5	28,784,213	264.83	23.39	399.1	3,476,357
08/24/1999	17:10	7,736	297.738	10.51	281.5	28,787,027	265.04	23.17	399.1	3,480,348
08/24/1999	17:20	7,746	297.363	10.89	281.5	28,789,842	265.21	23.00	399.1	3,484,338
08/24/1999	17:30	7,756	297.767	10.48	281.5	28,792,657	265.34	22.87	399.1	3,488,329
08/24/1999	17:40	7,766	297.882	10.37	281.5	28,795,471	265.52	22.69	399.1	3,492,319
08/24/1999	17:50	7,776	297.565	10.68	281.5	28,798,286	265.48	22.73	399.1	3,496,310
08/24/1999	18:00	7,786	297.752	10.50	281.5	28,801,101	265.49	22.72	399.1	3,500,301
08/24/1999	18:10	7,796	297.435	10.81	281.5	28,803,915	265.61	22.60	399.1	3,504,291
08/24/1999	18:20	7,806	297.536	10.71	281.5	28,806,730	265.83	22.38	399.1	3,508,282
08/24/1999	18:30	7,816	297.248	11.00	281.5	28,809,545	265.77	22.44	399.1	3,512,272
08/24/1999	18:40	7,826	297.565	10.68	281.5	28,812,359	265.30	22.92	399.1	3,516,263
08/24/1999	18:50	7,836	297.507	10.74	281.5	28,815,174	265.38	22.83	399.1	3,520,253
08/24/1999	19:00	7,846	297.608	10.64	281.5	28,817,989	265.74	22.47	399.1	3,524,244
08/24/1999	19:10	7,856	297.132	11.12	281.5	28,820,803	265.63	22.58	399.1	3,528,234
08/24/1999	19:20	7,866	297.623	10.63	281.5	28,823,618	265.78	22.44	399.1	3,532,225
08/24/1999	19:30	7,876	297.623	10.63	281.5	28,826,432	265.62	22.60	399.1	3,536,215
08/24/1999	19:40	7,886	297.68	10.57	281.5	28,829,247	265.77	22.44	399.1	3,540,206
08/24/1999	19:50	7,896	297.377	10.87	281.5	28,832,062	265.68	22.53	399.1	3,544,196
08/24/1999	20:00	7,906	297.81	10.44	281.5	28,834,876	265.99	22.22	399.1	3,548,187
08/24/1999	20:10	7,916	297.233	11.02	281.5	28,837,691	265.75	22.46	399.1	3,552,178
08/24/1999	20:20	7,926	297.291	10.96	281.5	28,840,506	266.06	22.15	399.1	3,556,168
08/24/1999	20:30	7,936	297.45	10.80	281.5	28,843,320	265.73	22.48	399.1	3,560,159
08/24/1999	20:40	7,946	297.003	11.25	281.5	28,846,135	265.67	22.54	399.1	3,564,149
08/24/1999	20:50	7,956	297.349	10.90	281.5	28,848,950	265.70	22.51	399.1	3,568,140
08/24/1999	21:00	7,966	297.536	10.71	281.5	28,851,764	265.75	22.46	399.1	3,572,130
08/24/1999	21:10	7,976	297.305	10.94	281.5	28,854,579	266.04	22.17	399.1	3,576,121
08/24/1999	21:20	7,986	297.522	10.73	281.5	28,857,394	265.87	22.34	399.1	3,580,111
08/24/1999	21:30	7,996	297.003	11.25	281.5	28,860,208	266.10	22.11	399.1	3,584,102
08/24/1999	21:40	8,006	297.291	10.96	281.5	28,863,023	265.85	22.36	399.1	3,588,092
08/24/1999	21:50	8,016	297.637	10.61	281.5	28,865,838	265.92	22.29	399.1	3,592,083
08/24/1999	22:00	8,026	297.363	10.89	281.5	28,868,652	265.70	22.51	399.1	3,596,073
08/24/1999	22:10	8,036	297.723	10.53	281.5	28,871,467	265.95	22.26	399.1	3,600,064
08/24/1999	22:20	8,046	297.32	10.93	281.5	28,874,282	266.13	22.08	399.1	3,604,054
08/24/1999	22:30	8,056	297.536	10.71	281.5	28,877,096	266.04	22.17	399.1	3,608,045
08/24/1999	22:40	8,066	297.579	10.67	281.5	28,879,911	266.17	22.04	399.1	3,612,036
08/24/1999	22:50	8,076	297.363	10.89	281.5	28,882,725	266.14	22.07	399.1	3,616,026
08/24/1999	23:00	8,086	297.089	11.16	281.5	28,885,540	265.73	22.48	399.1	3,620,017
08/24/1999	23:10	8,096	297.377	10.87	281.5	28,888,355	265.80	22.41	399.1	3,624,007
08/24/1999	23:20	8,106	297.392	10.86	281.5	28,891,169	265.92	22.29	399.1	3,627,998
08/24/1999	23:30	8,116	297.118	11.13	281.5	28,893,984	266.17	22.04	399.1	3,631,988
08/24/1999	23:40	8,126	297.55	10.70	281.5	28,896,799	265.71	22.50	399.1	3,635,979
08/24/1999	23:50	8,136	297.55	10.70	281.5	28,899,613	265.72	22.50	399.1	3,639,969
08/25/1999	0:00	8,146	297.219	11.03	281.5	28,902,428	265.62	22.59	399.1	3,643,960
08/25/1999	0:10	8,156	297.478	10.77	281.5	28,905,243	265.89	22.32	399.1	3,647,950
08/25/1999	0:20	8,166	297.623	10.63	281.5	28,908,057	265.71	22.50	399.1	3,651,941
08/25/1999	0:30	8,176	297.132	11.12	281.5	28,910,872	265.99	22.22	399.1	3,655,931
08/25/1999	0:40	8,186	297.003	11.25	281.5	28,913,687	266.17	22.04	399.1	3,659,922
08/25/1999	0:50	8,196	297.118	11.13	281.5	28,916,501	265.81	22.40	399.1	3,663,912
08/25/1999	1:00	8,206	297.161	11.09	281.5	28,919,316	265.67	22.54	399.1	3,667,903

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/25/1999	1:10	8,216	297.493	10.76	281.5	28,922,131	265.86	22.35	399.1	3,671,894
08/25/1999	1:20	8,226	297.435	10.81	281.5	28,924,945	266.03	22.18	399.1	3,675,884
08/25/1999	1:30	8,236	297.19	11.06	281.5	28,927,760	266.15	22.06	399.1	3,679,875
08/25/1999	1:40	8,246	297.45	10.80	281.5	28,930,574	266.24	21.97	399.1	3,683,865
08/25/1999	1:50	8,256	297.147	11.10	281.5	28,933,389	265.85	22.36	399.1	3,687,856
08/25/1999	2:00	8,266	297.406	10.84	281.5	28,936,204	265.70	22.51	399.1	3,691,846
08/25/1999	2:10	8,276	296.83	11.42	281.5	28,939,018	265.93	22.28	399.1	3,695,837
08/25/1999	2:20	8,286	297.031	11.22	281.5	28,941,833	266.00	22.21	399.1	3,699,827
08/25/1999	2:30	8,296	297.118	11.13	281.5	28,944,648	266.09	22.12	399.1	3,703,818
08/25/1999	2:40	8,306	297.392	10.86	281.5	28,947,462	266.15	22.06	399.1	3,707,808
08/25/1999	2:50	8,316	296.974	11.27	281.5	28,950,277	266.19	22.02	399.1	3,711,799
08/25/1999	3:00	8,326	296.873	11.38	281.5	28,953,092	266.05	22.16	399.1	3,715,789
08/25/1999	3:10	8,336	296.873	11.38	281.5	28,955,906	265.63	22.58	399.1	3,719,780
08/25/1999	3:20	8,346	296.902	11.35	281.5	28,958,721	265.83	22.38	399.1	3,723,771
08/25/1999	3:30	8,356	297.291	10.96	281.5	28,961,536	265.82	22.39	399.1	3,727,761
08/25/1999	3:40	8,366	297.349	10.90	281.5	28,964,350	265.94	22.27	399.1	3,731,752
08/25/1999	3:50	8,376	297.118	11.13	281.5	28,967,165	266.09	22.13	399.1	3,735,742
08/25/1999	4:00	8,386	297.046	11.20	281.5	28,969,980	266.05	22.16	399.1	3,739,733
08/25/1999	4:10	8,396	296.786	11.46	281.5	28,972,794	266.21	22.00	399.1	3,743,723
08/25/1999	4:20	8,406	296.916	11.33	281.5	28,975,609	266.16	22.05	399.1	3,747,714
08/25/1999	4:30	8,416	297.104	11.14	281.5	28,978,424	266.19	22.02	399.1	3,751,704
08/25/1999	4:40	8,426	296.887	11.36	281.5	28,981,238	265.85	22.37	399.1	3,755,695
08/25/1999	4:50	8,436	297.118	11.13	281.5	28,984,053	265.76	22.45	399.1	3,759,685
08/25/1999	5:00	8,446	297.334	10.91	281.5	28,986,867	266.13	22.08	399.1	3,763,676
08/25/1999	5:10	8,456	296.959	11.29	281.5	28,989,682	265.89	22.32	399.1	3,767,666
08/25/1999	5:20	8,466	297.06	11.19	281.5	28,992,497	266.14	22.08	399.1	3,771,657
08/25/1999	5:30	8,476	297.435	10.81	281.5	28,995,311	266.16	22.05	399.1	3,775,647
08/25/1999	5:40	8,486	296.887	11.36	281.5	28,998,126	266.03	22.18	399.1	3,779,638
08/25/1999	5:50	8,496	297.305	10.94	281.5	29,000,941	266.10	22.11	399.1	3,783,629
08/25/1999	6:00	8,506	296.887	11.36	281.5	29,003,755	265.94	22.27	399.1	3,787,619
08/25/1999	6:10	8,516	296.916	11.33	281.5	29,006,570	266.10	22.11	399.1	3,791,610
08/25/1999	6:20	8,526	296.83	11.42	281.5	29,009,385	265.80	22.41	399.1	3,795,600
08/25/1999	6:30	8,536	296.786	11.46	281.5	29,012,199	265.85	22.36	399.1	3,799,591
08/25/1999	6:40	8,546	297.06	11.19	281.5	29,015,014	265.94	22.27	399.1	3,803,581
08/25/1999	6:50	8,556	297.161	11.09	281.5	29,017,829	265.91	22.30	399.1	3,807,572
08/25/1999	7:00	8,566	297.435	10.81	281.5	29,020,643	265.65	22.56	399.1	3,811,562
08/25/1999	7:10	8,576	296.7	11.55	281.5	29,023,458	265.56	22.65	393.8	3,815,500
08/25/1999	7:20	8,586	296.772	11.48	281.5	29,026,273	265.56	22.65	393.8	3,819,438
08/25/1999	7:30	8,596	297.147	11.10	281.5	29,029,087	265.65	22.56	393.8	3,823,376
08/25/1999	7:40	8,606	296.959	11.29	281.5	29,031,902	265.59	22.62	393.8	3,827,313
08/25/1999	7:50	8,616	297.132	11.12	281.5	29,034,717	265.71	22.50	393.8	3,831,251
08/25/1999	8:00	8,626	296.988	11.26	281.5	29,037,531	265.60	22.62	393.8	3,835,189
08/25/1999	8:10	8,636	296.556	11.69	281.5	29,040,346	265.64	22.57	393.8	3,839,127
08/25/1999	8:20	8,646	296.887	11.36	281.5	29,043,160	265.55	22.66	393.8	3,843,064
08/25/1999	8:30	8,656	296.541	11.71	281.5	29,045,975	265.71	22.50	393.8	3,847,002
08/25/1999	8:40	8,666	297.003	11.25	281.5	29,048,790	265.74	22.47	393.8	3,850,940
08/25/1999	8:50	8,676	296.541	11.71	281.5	29,051,604	265.80	22.42	393.8	3,854,878
08/25/1999	9:00	8,686	296.512	11.74	281.5	29,054,419	265.61	22.61	393.8	3,858,815
08/25/1999	9:10	8,696	297.017	11.23	281.5	29,057,234	265.58	22.63	393.8	3,862,753
08/25/1999	9:20	8,706	297.06	11.19	281.5	29,060,048	265.27	22.94	393.8	3,866,691
08/25/1999	9:30	8,716	296.484	11.76	281.5	29,062,863	265.56	22.65	393.8	3,870,629
08/25/1999	9:40	8,726	296.729	11.52	281.5	29,065,678	265.58	22.63	393.8	3,874,566
08/25/1999	9:50	8,736	297.161	11.09	281.5	29,068,492	265.50	22.71	393.8	3,878,504
08/25/1999	10:00	8,746	296.599	11.65	281.5	29,071,307	265.78	22.43	393.8	3,882,442
08/25/1999	10:10	8,756	297.046	11.20	281.5	29,074,122	265.86	22.35	393.8	3,886,380
08/25/1999	10:20	8,766	297.046	11.20	281.5	29,076,936	265.93	22.29	393.8	3,890,317
08/25/1999	10:30	8,776	296.383	11.87	281.5	29,079,751	265.85	22.37	393.8	3,894,255
08/25/1999	10:40	8,786	296.541	11.71	281.5	29,082,566	265.85	22.36	393.8	3,898,193
08/25/1999	10:50	8,796	297.19	11.06	281.5	29,085,380	265.93	22.28	393.8	3,902,131

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/25/1999	11:00	8,806	296.628	11.62	281.5	29,088,195	265.88	22.33	393.8	3,906,068
08/25/1999	11:10	8,816	297.204	11.04	281.5	29,091,009	265.85	22.36	393.8	3,910,006
08/25/1999	11:20	8,826	296.887	11.36	281.5	29,093,824	265.48	22.73	393.8	3,913,944
08/25/1999	11:30	8,836	296.902	11.35	281.5	29,096,639	265.49	22.73	393.8	3,917,882
08/25/1999	11:40	8,846	297.017	11.23	281.5	29,099,453	265.70	22.51	393.8	3,921,819
08/25/1999	11:50	8,856	296.527	11.72	281.5	29,102,268	265.70	22.51	393.8	3,925,757
08/25/1999	12:00	8,866	297.089	11.16	281.5	29,105,083	265.71	22.50	393.8	3,929,695
08/25/1999	12:10	8,876	297.031	11.22	281.5	29,107,897	265.43	22.78	393.8	3,933,633
08/25/1999	12:20	8,886	296.988	11.26	281.5	29,110,712	265.40	22.81	393.8	3,937,570
08/25/1999	12:30	8,896	296.873	11.38	281.5	29,113,527	265.55	22.66	393.8	3,941,508
08/25/1999	12:40	8,906	297.161	11.09	281.5	29,116,341	265.53	22.68	393.8	3,945,446
08/25/1999	12:50	8,916	296.83	11.42	281.5	29,119,156	265.88	22.34	394.6	3,949,391
08/25/1999	13:00	8,926	296.974	11.27	281.5	29,121,971	265.26	22.95	394.6	3,953,337
08/25/1999	13:10	8,936	296.772	11.48	281.5	29,124,785	265.49	22.72	394.6	3,957,283
08/25/1999	13:20	8,946	296.786	11.46	281.5	29,127,600	265.25	22.96	394.6	3,961,228
08/25/1999	13:30	8,956	297.089	11.16	281.5	29,130,415	265.49	22.72	394.6	3,965,174
08/25/1999	13:40	8,966	296.613	11.64	281.5	29,133,229	265.41	22.80	394.6	3,969,120
08/25/1999	13:50	8,976	296.931	11.32	281.5	29,136,044	265.34	22.87	394.6	3,973,065
08/25/1999	14:00	8,986	296.873	11.38	281.5	29,138,859	265.36	22.85	394.6	3,977,011
08/25/1999	14:10	8,996	296.642	11.61	281.5	29,141,673	265.58	22.63	394.6	3,980,956
08/25/1999	14:20	9,006	296.412	11.84	281.5	29,144,488	265.68	22.53	394.6	3,984,902
08/25/1999	14:30	9,016	296.786	11.46	281.5	29,147,302	265.13	23.08	394.6	3,988,848
08/25/1999	14:40	9,026	296.916	11.33	281.5	29,150,117	265.27	22.94	394.6	3,992,793
08/25/1999	14:50	9,036	296.815	11.43	281.5	29,152,932	265.47	22.74	394.6	3,996,739
08/25/1999	15:00	9,046	297.118	11.13	281.5	29,155,746	265.37	22.84	394.6	4,000,685
08/25/1999	15:10	9,056	296.368	11.88	281.5	29,158,561	265.45	22.76	394.6	4,004,630
08/25/1999	15:20	9,066	297.161	11.09	281.5	29,161,376	265.57	22.64	394.6	4,008,576
08/25/1999	15:30	9,076	296.988	11.26	281.5	29,164,190	265.29	22.92	394.6	4,012,521
08/25/1999	15:40	9,086	296.57	11.68	281.5	29,167,005	265.19	23.02	394.6	4,016,467
08/25/1999	15:50	9,096	296.931	11.32	281.5	29,169,820	265.17	23.05	394.6	4,020,413
08/25/1999	16:00	9,106	296.426	11.82	281.5	29,172,634	265.27	22.94	394.6	4,024,358
08/25/1999	16:10	9,116	296.368	11.88	281.5	29,175,449	265.02	23.19	394.6	4,028,304
08/25/1999	16:20	9,126	296.282	11.97	281.5	29,178,264	265.33	22.88	394.6	4,032,250
08/25/1999	16:30	9,136	296.44	11.81	281.5	29,181,078	265.43	22.78	394.6	4,036,195
08/25/1999	16:40	9,146	296.455	11.79	281.5	29,183,893	264.97	23.24	394.6	4,040,141
08/25/1999	16:50	9,156	297.017	11.23	281.5	29,186,708	265.26	22.95	394.6	4,044,086
08/25/1999	17:00	9,166	297.132	11.12	281.5	29,189,522	265.34	22.87	394.6	4,048,032
08/25/1999	17:10	9,176	296.83	11.42	281.5	29,192,337	265.06	23.15	394.6	4,051,978
08/25/1999	17:20	9,186	296.642	11.61	281.5	29,195,151	265.15	23.06	394.6	4,055,923
08/25/1999	17:30	9,196	296.959	11.29	281.5	29,197,966	264.89	23.32	394.6	4,059,869
08/25/1999	17:40	9,206	296.556	11.69	281.5	29,200,781	264.98	23.23	394.6	4,063,814
08/25/1999	17:50	9,216	296.887	11.36	281.5	29,203,595	264.85	23.36	394.6	4,067,760
08/25/1999	18:00	9,226	296.484	11.76	281.5	29,206,410	264.86	23.35	394.6	4,071,706
08/25/1999	18:10	9,236	296.916	11.33	281.5	29,209,225	265.12	23.09	394.6	4,075,651
08/25/1999	18:20	9,246	296.844	11.40	281.5	29,212,039	264.81	23.40	394.6	4,079,597
08/25/1999	18:30	9,256	296.57	11.68	281.5	29,214,854	264.81	23.40	394.6	4,083,543
08/25/1999	18:40	9,266	296.469	11.78	281.5	29,217,669	264.86	23.35	394.6	4,087,488
08/25/1999	18:50	9,276	296.498	11.75	281.5	29,220,483	264.99	23.22	394.6	4,091,434
08/25/1999	19:00	9,286	296.426	11.82	281.5	29,223,298	265.06	23.15	394.6	4,095,379
08/25/1999	19:10	9,296	296.743	11.51	281.5	29,226,113	265.33	22.89	394.6	4,099,325
08/25/1999	19:20	9,306	296.959	11.29	281.5	29,228,927	265.25	22.96	394.6	4,103,271
08/25/1999	19:30	9,316	296.945	11.30	281.5	29,231,742	264.85	23.36	394.6	4,107,216
08/25/1999	19:40	9,326	296.383	11.87	281.5	29,234,557	264.94	23.27	394.6	4,111,162
08/25/1999	19:50	9,336	296.758	11.49	281.5	29,237,371	264.77	23.44	394.6	4,115,108
08/25/1999	20:00	9,346	296.325	11.92	281.5	29,240,186	265.00	23.21	394.6	4,119,053
08/25/1999	20:10	9,356	296.541	11.71	281.5	29,243,001	265.06	23.16	394.6	4,122,999
08/25/1999	20:20	9,366	296.57	11.68	281.5	29,245,815	265.14	23.08	394.6	4,126,944
08/25/1999	20:30	9,376	296.613	11.64	281.5	29,248,630	264.74	23.48	394.6	4,130,890
08/25/1999	20:40	9,386	296.512	11.74	281.5	29,251,444	265.00	23.21	394.6	4,134,836

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/25/1999	20:50	9,396	296.714	11.53	281.5	29,254,259	264.87	23.34	394.6	4,138,781
08/25/1999	21:00	9,406	296.383	11.87	281.5	29,257,074	264.91	23.30	394.6	4,142,727
08/25/1999	21:10	9,416	296.311	11.94	281.5	29,259,888	265.08	23.13	394.6	4,146,673
08/25/1999	21:20	9,426	296.397	11.85	281.5	29,262,703	265.04	23.17	394.6	4,150,618
08/25/1999	21:30	9,436	296.628	11.62	281.5	29,265,518	265.13	23.08	394.6	4,154,564
08/25/1999	21:40	9,446	296.671	11.58	281.5	29,268,332	265.30	22.91	394.6	4,158,509
08/25/1999	21:50	9,456	296.931	11.32	281.5	29,271,147	264.84	23.37	394.6	4,162,455
08/25/1999	22:00	9,466	296.426	11.82	281.5	29,273,962	264.90	23.31	394.6	4,166,401
08/25/1999	22:10	9,476	296.7	11.55	281.5	29,276,776	264.83	23.38	394.6	4,170,346
08/25/1999	22:20	9,486	296.527	11.72	281.5	29,279,591	265.21	23.00	394.6	4,174,292
08/25/1999	22:30	9,496	296.844	11.40	281.5	29,282,406	265.22	22.99	394.6	4,178,238
08/25/1999	22:40	9,506	296.541	11.71	281.5	29,285,220	265.25	22.96	394.6	4,182,183
08/25/1999	22:50	9,516	296.714	11.53	281.5	29,288,035	265.45	22.76	394.6	4,186,129
08/25/1999	23:00	9,526	296.657	11.59	281.5	29,290,850	265.19	23.02	394.6	4,190,074
08/25/1999	23:10	9,536	296.873	11.38	281.5	29,293,664	265.17	23.04	394.6	4,194,020
08/25/1999	23:20	9,546	296.325	11.92	281.5	29,296,479	265.37	22.84	394.6	4,197,966
08/25/1999	23:30	9,556	296.556	11.69	281.5	29,299,294	265.26	22.95	394.6	4,201,911
08/25/1999	23:40	9,566	296.239	12.01	281.5	29,302,108	265.14	23.07	394.6	4,205,857
08/25/1999	23:50	9,576	296.541	11.71	281.5	29,304,923	265.27	22.94	394.6	4,209,803
08/26/1999	0:00	9,586	296.123	12.13	281.5	29,307,737	265.37	22.84	394.6	4,213,748
08/26/1999	0:10	9,596	296.84	11.40	281.5	29,310,552	264.93	23.28	394.6	4,217,694
08/26/1999	0:20	9,606	296.86	11.39	281.5	29,313,367	265.01	23.20	394.6	4,221,639
08/26/1999	0:30	9,616	296.54	11.71	281.5	29,316,181	265.12	23.09	394.6	4,225,585
08/26/1999	0:40	9,626	296.08	12.17	281.5	29,318,996	265.14	23.07	394.6	4,229,531
08/26/1999	0:50	9,636	296.40	11.85	281.5	29,321,811	265.05	23.16	394.6	4,233,476
08/26/1999	1:00	9,646	296.73	11.52	281.5	29,324,625	265.01	23.20	394.6	4,237,422
08/26/1999	1:10	9,656	296.07	12.18	281.5	29,327,440	265.13	23.08	394.6	4,241,368
08/26/1999	1:20	9,666	296.38	11.87	281.5	29,330,255	265.09	23.12	394.6	4,245,313
08/26/1999	1:30	9,676	296.74	11.51	281.5	29,333,069	265.09	23.12	394.6	4,249,259
08/26/1999	1:40	9,686	296.20	12.05	281.5	29,335,884	265.07	23.14	394.6	4,253,204
08/26/1999	1:50	9,696	296.07	12.18	281.5	29,338,699	265.37	22.84	394.6	4,257,150
08/26/1999	2:00	9,706	296.76	11.49	281.5	29,341,513	265.18	23.03	394.6	4,261,096
08/26/1999	2:10	9,716	296.53	11.72	281.5	29,344,328	265.26	22.95	394.6	4,265,041
08/26/1999	2:20	9,726	296.18	12.07	281.5	29,347,143	264.79	23.42	394.6	4,268,987
08/26/1999	2:30	9,736	296.57	11.68	281.5	29,349,957	264.80	23.41	394.6	4,272,933
08/26/1999	2:40	9,746	296.12	12.13	281.5	29,352,772	265.02	23.19	394.6	4,276,878
08/26/1999	2:50	9,756	296.08	12.17	281.5	29,355,586	265.07	23.14	394.6	4,280,824
08/26/1999	3:00	9,766	296.54	11.71	281.5	29,358,401	264.73	23.48	394.6	4,284,769
08/26/1999	3:10	9,776	296.54	11.71	281.5	29,361,216	264.99	23.22	394.6	4,288,715
08/26/1999	3:20	9,786	296.60	11.65	281.5	29,364,030	264.98	23.23	394.6	4,292,661
08/26/1999	3:30	9,796	296.12	12.13	281.5	29,366,845	265.02	23.19	394.6	4,296,606
08/26/1999	3:40	9,806	296.18	12.07	281.5	29,369,660	265.11	23.11	394.6	4,300,552
08/26/1999	3:50	9,816	296.46	11.79	281.5	29,372,474	265.08	23.13	394.6	4,304,497
08/26/1999	4:00	9,826	295.92	12.33	281.5	29,375,289	264.80	23.41	394.6	4,308,443
08/26/1999	4:10	9,836	295.99	12.26	281.5	29,378,104	264.69	23.53	394.6	4,312,389
08/26/1999	4:20	9,846	296.28	11.97	281.5	29,380,918	264.72	23.49	394.6	4,316,334
08/26/1999	4:30	9,856	296.12	12.13	281.5	29,383,733	264.73	23.48	394.6	4,320,280
08/26/1999	4:40	9,866	296.27	11.98	281.5	29,386,548	264.50	23.71	394.6	4,324,226
08/26/1999	4:50	9,876	296.54	11.71	281.5	29,389,362	264.77	23.44	394.6	4,328,171
08/26/1999	5:00	9,886	296.24	12.01	281.5	29,392,177	264.96	23.25	394.6	4,332,117
08/26/1999	5:10	9,896	296.30	11.95	281.5	29,394,992	264.98	23.23	394.6	4,336,062
08/26/1999	5:20	9,906	296.44	11.81	281.5	29,397,806	264.66	23.55	394.6	4,340,008
08/26/1999	5:30	9,916	296.11	12.14	281.5	29,400,621	264.88	23.33	394.6	4,343,954
08/26/1999	5:40	9,926	296.05	12.20	281.5	29,403,436	264.73	23.48	394.6	4,347,899
08/26/1999	5:50	9,936	296.09	12.15	281.5	29,406,250	265.11	23.10	394.6	4,351,845
08/26/1999	6:00	9,946	296.04	12.21	281.5	29,409,065	265.01	23.20	394.6	4,355,791
08/26/1999	6:10	9,956	296.50	11.75	281.5	29,411,879	264.80	23.41	394.6	4,359,736
08/26/1999	6:20	9,966	296.18	12.07	281.5	29,414,694	264.96	23.25	394.6	4,363,682
08/26/1999	6:30	9,976	296.50	11.75	281.5	29,417,509	264.83	23.39	394.6	4,367,627

YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/26/1999	6:40	9,986	296.40	11.85	281.5	29,420,323	264.81	23.40	394.6	4,371,573
08/26/1999	6:50	9,996	296.17	12.08	281.5	29,423,138	264.84	23.37	394.6	4,375,519
08/26/1999	7:00	10,006	296.22	12.02	281.5	29,425,953	264.64	23.57	394.6	4,379,464
08/26/1999	7:10	10,016	296.24	12.01	281.5	29,428,767	264.72	23.49	394.6	4,383,410
08/26/1999	7:20	10,026	296.08	12.17	281.5	29,431,582	264.90	23.31	394.6	4,387,356
08/26/1999	7:30	10,036	295.89	12.36	281.5	29,434,397	264.87	23.34	394.6	4,391,301
08/26/1999	7:40	10,046	295.99	12.26	281.5	29,437,211	264.94	23.28	394.6	4,395,247
08/26/1999	7:50	10,056	296.40	11.85	281.5	29,440,026	264.92	23.29	394.6	4,399,192
08/26/1999	8:00	10,066	296.08	12.17	281.5	29,442,841	265.18	23.03	394.6	4,403,138
08/26/1999	8:10	10,076	295.91	12.34	281.5	29,445,655	264.85	23.36	394.6	4,407,084
08/26/1999	8:20	10,086	296.15	12.10	281.5	29,448,470	264.69	23.52	394.6	4,411,029
08/26/1999	8:30	10,096	296.37	11.88	281.5	29,451,285	264.98	23.23	394.6	4,414,975
08/26/1999	8:40	10,106	295.85	12.40	281.5	29,454,099	264.69	23.52	394.6	4,418,921
08/26/1999	8:50	10,116	296.24	12.01	281.5	29,456,914	264.66	23.55	394.6	4,422,866
08/26/1999	9:00	10,126	296.18	12.07	281.5	29,459,728	264.77	23.44	394.6	4,426,812
08/26/1999	9:10	10,136	296.44	11.81	281.5	29,462,543	265.02	23.19	394.6	4,430,757
08/26/1999	9:20	10,146	296.30	11.95	281.5	29,465,358	264.98	23.23	394.6	4,434,703
08/26/1999	9:30	10,156	295.89	12.36	281.5	29,468,172	264.91	23.30	394.6	4,438,649
08/26/1999	9:40	10,166	296.24	12.01	281.5	29,470,987	265.09	23.12	394.6	4,442,594
08/26/1999	9:50	10,176	295.91	12.34	281.5	29,473,802	265.00	23.21	394.6	4,446,540
08/26/1999	10:00	10,186	295.75	12.50	281.5	29,476,616	264.86	23.35	394.6	4,450,486
08/26/1999	10:10	10,196	295.86	12.38	281.5	29,479,431	265.03	23.18	394.6	4,454,431
08/26/1999	10:20	10,206	296.11	12.14	281.5	29,482,246	264.63	23.58	394.6	4,458,377
08/26/1999	10:30	10,216	296.12	12.13	281.5	29,485,060	264.70	23.51	394.6	4,462,322
08/26/1999	10:40	10,226	295.91	12.34	281.5	29,487,875	264.69	23.52	394.6	4,466,268
08/26/1999	10:50	10,236	295.97	12.28	281.5	29,490,690	264.83	23.38	394.6	4,470,214
08/26/1999	11:00	10,246	295.68	12.57	281.5	29,493,504	264.92	23.29	394.6	4,474,159
08/26/1999	11:10	10,256	295.63	12.62	281.5	29,496,319	264.94	23.28	394.6	4,478,105
08/26/1999	11:20	10,266	296.46	11.79	281.5	29,499,134	264.77	23.44	394.6	4,482,051
08/26/1999	11:30	10,276	296.35	11.89	281.5	29,501,948	264.53	23.68	394.6	4,485,996
08/26/1999	11:40	10,286	295.85	12.40	281.5	29,504,763	264.56	23.65	394.6	4,489,942
08/26/1999	11:50	10,296	296.11	12.14	281.5	29,507,578	264.75	23.47	394.6	4,493,887
08/26/1999	12:00	10,306	296.08	12.17	281.5	29,510,392	264.76	23.46	394.6	4,497,833
08/26/1999	12:10	10,316	296.31	11.94	281.5	29,513,207	264.76	23.45	394.6	4,501,779
08/26/1999	12:20	10,326	295.98	12.27	281.5	29,516,021	264.81	23.40	394.6	4,505,724
08/26/1999	12:30	10,336	296.46	11.79	281.5	29,518,836	264.65	23.56	394.6	4,509,670
08/26/1999	12:40	10,346	295.86	12.38	281.5	29,521,651	264.68	23.53	394.6	4,513,616
08/26/1999	12:50	10,356	296.28	11.97	281.5	29,524,465	264.85	23.36	394.6	4,517,561
08/26/1999	13:00	10,366	296.09	12.15	281.5	29,527,280	264.74	23.47	394.6	4,521,507
08/26/1999	13:10	10,376	296.46	11.79	281.5	29,530,095	264.59	23.62	394.6	4,525,452
08/26/1999	13:20	10,386	296.07	12.18	281.5	29,532,909	264.70	23.51	394.6	4,529,398
08/26/1999	13:30	10,396	296.38	11.87	281.5	29,535,724	264.65	23.56	394.6	4,533,344
08/26/1999	13:40	10,406	295.89	12.36	281.5	29,538,539	264.78	23.43	394.6	4,537,289
08/26/1999	13:50	10,416	296.08	12.17	281.5	29,541,353	264.91	23.30	394.6	4,541,235
08/26/1999	14:00	10,426	295.92	12.33	281.5	29,544,168	264.96	23.25	394.6	4,545,180
08/26/1999	14:10	10,436	296.38	11.87	281.5	29,546,983	264.82	23.39	394.6	4,549,126
08/26/1999	14:20	10,446	295.78	12.47	281.5	29,549,797	264.72	23.49	394.6	4,553,072
08/26/1999	14:30	10,456	296.12	12.13	281.5	29,552,612	264.71	23.50	394.6	4,557,017
08/26/1999	14:40	10,466	296.40	11.85	281.5	29,555,427	264.79	23.43	394.6	4,560,963
08/26/1999	14:50	10,476	296.28	11.97	281.5	29,558,241			394.6	4,564,909
08/26/1999	15:00	10,486	296.04	12.21	281.5	29,561,056	265.83	22.39	395.1	4,568,860
08/26/1999	15:10	10,496	296.22	12.02	281.5	29,563,871	265.44	22.77	395.1	4,572,811
08/26/1999	15:20	10,506	296.38	11.87	281.1	29,566,682	265.46	22.75	395.1	4,576,762
08/26/1999	15:30	10,516	295.62	12.63	281.1	29,569,493	265.60	22.61	395.1	4,580,713
08/26/1999	15:40	10,526	295.71	12.54	281.1	29,572,304	265.24	22.97	395.1	4,584,664
08/26/1999	15:50	10,536	296.34	11.91	281.1	29,575,115	265.52	22.70	395.1	4,588,615
08/26/1999	16:00	10,546	296.17	12.08	281.1	29,577,927	265.65	22.56	395.1	4,592,567
08/26/1999	16:10	10,556	296.33	11.92	281.1	29,580,738	265.64	22.57	395.1	4,596,518
08/26/1999	16:20	10,566	295.91	12.34	281.1	29,583,549	265.66	22.55	395.1	4,600,469

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #3 & Well #4
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/26/1999	16:30	10,576	295.92	12.33	281.1	29,586,360	265.57	22.64	395.1	4,604,420
08/26/1999	16:40	10,586	295.82	12.43	281.1	29,589,172	265.77	22.44	395.1	4,608,371
08/26/1999	16:50	10,596	295.81	12.44	281.1	29,591,983	265.75	22.46	395.1	4,612,322
08/26/1999	17:00	10,606	296.31	11.94	281.1	29,594,794	265.71	22.51	395.1	4,616,274
08/26/1999	17:10	10,616	295.97	12.28	281.1	29,597,605	265.71	22.50	395.1	4,620,225
08/26/1999	17:20	10,626	296.22	12.02	281.1	29,600,417	265.67	22.54	395.1	4,624,176
08/26/1999	17:30	10,636	295.86	12.38	281.1	29,603,228	265.72	22.49	395.1	4,628,127
08/26/1999	17:40	10,646	295.65	12.60	281.1	29,606,039	265.58	22.64	395.1	4,632,078
08/26/1999	17:50	10,656	295.76	12.49	281.1	29,608,850	265.69	22.52	395.1	4,636,029
08/26/1999	18:00	10,666	295.97	12.28	281.1	29,611,662	265.67	22.54	395.1	4,639,980
08/26/1999	18:10	10,676	296.35	11.89	281.1	29,614,473	265.56	22.65	395.1	4,643,932
08/26/1999	18:20	10,686	295.94	12.31	281.1	29,617,284	265.53	22.68	395.1	4,647,883
08/26/1999	18:30	10,696	295.98	12.27	281.1	29,620,095	265.05	23.16	395.1	4,651,834
08/26/1999	18:40	10,706	296.31	11.94	281.1	29,622,907	265.31	22.90	395.1	4,655,785
08/26/1999	18:50	10,716	295.91	12.34	281.1	29,625,718	265.56	22.65	395.1	4,659,736
08/26/1999	19:00	10,726	296.24	12.01	281.1	29,628,529	265.34	22.87	395.1	4,663,687
08/26/1999	19:10	10,736	296.17	12.08	281.1	29,631,340	265.44	22.77	395.1	4,667,638
08/26/1999	19:20	10,746	296.34	11.91	281.1	29,634,152	265.51	22.70	395.1	4,671,590
08/26/1999	19:30	10,756	296.05	12.20	281.1	29,636,963	265.52	22.69	395.1	4,675,541
08/26/1999	19:40	10,766	296.14	12.11	281.1	29,639,774	265.16	23.05	395.1	4,679,492
08/26/1999	19:50	10,776	295.62	12.63	281.1	29,642,585	265.11	23.10	395.1	4,683,443
08/26/1999	20:00	10,786	296.27	11.98	281.1	29,645,397	265.47	22.74	395.1	4,687,394
08/26/1999	20:10	10,796	295.75	12.50	281.1	29,648,208	265.56	22.66	395.1	4,691,345
08/26/1999	20:20	10,806	295.53	12.72	281.1	29,651,019	265.50	22.71	395.1	4,695,296
08/26/1999	20:30	10,816	295.91	12.34	281.1	29,653,830	265.56	22.65	395.1	4,699,248
08/26/1999	20:40	10,826	295.71	12.54	281.1	29,656,642	265.04	23.18	395.1	4,703,199
08/26/1999	20:50	10,836	296.07	12.18	281.1	29,659,453	265.07	23.15	395.1	4,707,150
08/26/1999	21:00	10,846	296.11	12.14	281.1	29,662,264	265.17	23.04	395.1	4,711,101
08/26/1999	21:10	10,856	295.60	12.64	281.1	29,665,075	265.18	23.03	395.1	4,715,052
08/26/1999	21:20	10,866	295.75	12.50	281.1	29,667,887	265.19	23.02	395.1	4,719,003
08/26/1999	21:30	10,876	296.11	12.14	281.1	29,670,698	265.17	23.04	395.1	4,722,954
08/26/1999	21:40	10,886	296.02	12.23	281.1	29,673,509	265.16	23.05	395.1	4,726,906
08/26/1999	21:50	10,896	295.55	12.70	281.1	29,676,320	265.14	23.07	395.1	4,730,857
08/26/1999	22:00	10,906	295.62	12.63	281.1	29,679,132	265.29	22.92	395.1	4,734,808
08/26/1999	22:10	10,916	295.89	12.36	281.1	29,681,943	264.85	23.36	395.1	4,738,759
08/26/1999	22:20	10,926	295.55	12.70	281.1	29,684,754	264.85	23.36	395.1	4,742,710
08/26/1999	22:30	10,936	296.17	12.08	281.1	29,687,565	265.34	22.87	395.1	4,746,661
08/26/1999	22:40	10,946	296.09	12.15	281.1	29,690,377	265.34	22.87	395.1	4,750,613
08/26/1999	22:50	10,956	295.95	12.30	281.1	29,693,188	265.27	22.94	395.1	4,754,564
08/26/1999	23:00	10,966	295.79	12.46	281.1	29,695,999	265.06	23.16	395.1	4,758,515
08/26/1999	23:10	10,976	295.69	12.56	281.1	29,698,810	265.15	23.06	395.1	4,762,466
08/26/1999	23:20	10,986	296.33	11.92	281.1	29,701,622	265.15	23.06	395.1	4,766,417
08/26/1999	23:30	10,996	295.68	12.57	281.1	29,704,433	265.27	22.94	395.1	4,770,368
08/26/1999	23:40	11,006	295.95	12.30	281.1	29,707,244	265.07	23.14	395.1	4,774,319
08/26/1999	23:50	11,016	295.56	12.69	281.1	29,710,055	265.27	22.94	395.1	4,778,271
08/27/1999	0:00	11,026	295.40	12.85	281.1	29,712,867	265.25	22.96	395.1	4,782,222
08/27/1999	0:10	11,036	295.58	12.67	281.1	29,715,678	265.15	23.06	395.1	4,786,173
08/27/1999	0:20	11,046	295.50	12.75	281.1	29,718,489	265.16	23.05	395.1	4,790,124
08/27/1999	0:30	11,056	296.08	12.17	281.1	29,721,300	265.33	22.88	395.1	4,794,075
08/27/1999	0:40	11,066	295.47	12.77	281.1	29,724,112	265.27	22.95	395.1	4,798,026
08/27/1999	0:50	11,076	295.91	12.34	281.1	29,726,923	265.29	22.92	395.1	4,801,977
08/27/1999	1:00	11,086	295.95	12.30	281.1	29,729,734	265.14	23.07	395.1	4,805,929
08/27/1999	1:10	11,096	295.73	12.51	281.1	29,732,545	265.27	22.94	395.1	4,809,880
08/27/1999	1:20	11,106	295.91	12.34	281.1	29,735,357	265.33	22.88	395.1	4,813,831
08/27/1999	1:30	11,116	296.17	12.08	281.1	29,738,168	265.31	22.90	395.1	4,817,782
08/27/1999	1:40	11,126	295.46	12.79	281.1	29,740,979	264.82	23.39	395.1	4,821,733
08/27/1999	1:50	11,136	296.07	12.18	281.1	29,743,790	264.86	23.35	395.1	4,825,684
08/27/1999	2:00	11,146	295.75	12.50	281.1	29,746,602	264.91	23.30	395.1	4,829,635
08/27/1999	2:10	11,156	296.01	12.24	281.1	29,749,413	264.94	23.27	395.1	4,833,587

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #3 & Well #4
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

			WELL 3				WELL 4			
Date	Time	ET (min)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/27/1999	2:20	11,166	295.86	12.38	281.1	29,752,224	265.00	23.21	395.1	4,837,538
08/27/1999	2:30	11,176	296.14	12.11	281.1	29,755,035	264.96	23.25	395.1	4,841,489
08/27/1999	2:40	11,186	295.97	12.28	281.1	29,757,847	264.90	23.31	395.1	4,845,440
08/27/1999	2:50	11,196	295.95	12.30	281.1	29,760,658	265.04	23.17	395.1	4,849,391
08/27/1999	3:00	11,206	296.04	12.21	281.1	29,763,469	265.16	23.05	395.1	4,853,342
08/27/1999	3:10	11,216	295.37	12.87	281.1	29,766,280	265.09	23.12	395.1	4,857,293
08/27/1999	3:20	11,226	295.46	12.79	281.1	29,769,092	265.06	23.15	395.1	4,861,245
08/27/1999	3:30	11,236	295.99	12.26	281.1	29,771,903	265.01	23.20	395.1	4,865,196
08/27/1999	3:40	11,246	296.11	12.14	281.1	29,774,714	264.80	23.41	395.1	4,869,147
08/27/1999	3:50	11,256	295.84	12.41	281.1	29,777,525	264.64	23.57	395.1	4,873,098
08/27/1999	4:00	11,266	296.20	12.05	281.1	29,780,337	264.72	23.49	395.1	4,877,049
08/27/1999	4:10	11,276	295.94	12.31	281.1	29,783,148	264.67	23.55	395.1	4,881,000
08/27/1999	4:20	11,286	295.92	12.33	281.1	29,785,959	264.95	23.26	395.1	4,884,952
08/27/1999	4:30	11,296	295.42	12.83	281.1	29,788,770	264.86	23.35	395.1	4,888,903
08/27/1999	4:40	11,306	295.85	12.40	281.1	29,791,582	265.04	23.17	395.1	4,892,854
08/27/1999	4:50	11,316	295.71	12.54	281.1	29,794,393	265.08	23.13	395.1	4,896,805
08/27/1999	5:00	11,326	295.71	12.54	281.1	29,797,204	265.11	23.10	395.1	4,900,756
08/27/1999	5:10	11,336	295.55	12.70	281.1	29,800,015	265.02	23.19	395.1	4,904,707
08/27/1999	5:20	11,346	295.71	12.54	281.1	29,802,827	265.09	23.12	395.1	4,908,658
08/27/1999	5:30	11,356	296.09	12.15	281.1	29,805,638	264.87	23.34	395.1	4,912,610
08/27/1999	5:40	11,366	295.42	12.83	281.1	29,808,449	264.93	23.28	395.1	4,916,561
08/27/1999	5:50	11,376	295.46	12.79	281.1	29,811,260	265.13	23.09	395.1	4,920,512
08/27/1999	6:00	11,386	295.76	12.49	281.1	29,814,072	264.76	23.45	395.1	4,924,463
08/27/1999	6:10	11,396	295.78	12.47	281.1	29,816,883	264.73	23.49	395.1	4,928,414
08/27/1999	6:20	11,406	296.07	12.18	281.1	29,819,694	264.83	23.38	395.1	4,932,365
08/27/1999	6:30	11,416	295.69	12.56	281.1	29,822,505	264.84	23.37	395.1	4,936,316
08/27/1999	6:40	11,426	295.66	12.59	281.1	29,825,317	264.71	23.50	395.1	4,940,268
08/27/1999	6:50	11,436	295.32	12.93	281.1	29,828,128	264.81	23.40	395.1	4,944,219
08/27/1999	7:00	11,446	295.78	12.47	281.1	29,830,939	264.96	23.25	395.1	4,948,170
08/27/1999	7:10	11,456	295.78	12.47	281.1	29,833,750	265.04	23.18	395.1	4,952,121
08/27/1999	7:20	11,466	295.27	12.98	281.1	29,836,562	265.08	23.13	395.1	4,956,072
08/27/1999	7:30	11,476	296.12	12.13	281.1	29,839,373	265.03	23.18	395.1	4,960,023
08/27/1999	7:40	11,486	295.39	12.86	281.1	29,842,184	265.01	23.20	395.1	4,963,974
08/27/1999	7:50	11,496	295.24	13.00	281.1	29,844,995	265.00	23.21	395.1	4,967,926
08/27/1999	8:00	11,506	295.79	12.46	281.1	29,847,807	264.61	23.60	395.1	4,971,877
08/27/1999	8:10	11,516	295.94	12.31	281.1	29,850,618	264.64	23.57	395.1	4,975,828
08/27/1999	8:20	11,526	296.02	12.23	281.1	29,853,429	264.80	23.41	395.1	4,979,779
08/27/1999	8:30	11,536	295.27	12.98	281.1	29,856,240	264.80	23.41	395.1	4,983,730
08/27/1999	8:40	11,546	295.04	13.21	281.1	29,859,052	264.78	23.43	395.1	4,987,681
08/27/1999	8:50	11,556	295.30	12.95	281.1	29,861,863	264.79	23.42	395.1	4,991,632
08/27/1999	9:00	11,566	295.71	12.54	281.1	29,864,674	264.97	23.25	395.1	4,995,584
08/27/1999	9:10	11,576	295.17	13.08	281.1	29,867,485	264.67	23.54	395.1	4,999,535
08/27/1999	9:20	11,586	295.16	13.09	281.1	29,870,297	264.67	23.54	395.1	5,003,486
08/27/1999	9:30	11,596	295.19	13.06	281.1	29,873,108	264.69	23.52	395.1	5,007,437
08/27/1999	9:40	11,606	295.13	13.12	281.1	29,875,919	264.89	23.32	395.1	5,011,388
08/27/1999	9:50	11,616	295.85	12.40	281.1	29,878,730	264.87	23.34	395.1	5,015,339
08/27/1999	10:00	11,626	295.14	13.11	281.1	29,881,542	264.96	23.25	395.1	5,019,291
08/27/1999	10:10	11,636	295.37	12.87	281.1	29,884,353	264.87	23.34	395.1	5,023,242
08/27/1999	10:20	11,646	295.76	12.49	281.1	29,887,164	264.91	23.30	395.1	5,027,193
08/27/1999	10:30	11,656	296.04	12.21	281.1	29,889,975	264.95	23.26	395.1	5,031,144
08/27/1999	10:40	11,666	295.49	12.76	281.1	29,892,787	264.90	23.31	395.1	5,035,095
08/27/1999	10:50	11,676	295.60	12.64	281.1	29,895,597	265.47	22.74	396.0	5,039,055
08/27/1999	11:00	11,686	295.46	12.79	281.1	29,898,408	265.55	22.66	396.0	5,043,015
08/27/1999	11:10	11,696	295.27	12.98	281.1	29,901,219	265.49	22.72	396.0	5,046,975
08/27/1999	11:20	11,706	295.26	12.99	281.1	29,904,029	265.58	22.63	396.0	5,050,935
08/27/1999	11:30	11,716	295.60	12.64	281.1	29,906,840	265.60	22.61	396.0	5,054,895
08/27/1999	11:40	11,726	295.52	12.73	281.1	29,909,651	265.67	22.55	396.0	5,058,855
08/27/1999	11:50	11,736	295.82	12.43	281.1	29,912,461	265.57	22.65	396.0	5,062,815
08/27/1999	12:00	11,746	295.75	12.50	281.1	29,915,272	265.15	23.06	396.0	5,066,775

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38 Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield Well #3 & Well #4
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/27/1999	12:10	11,756	295.23	13.02	281.1	29,918,082	265.31	22.91	396.0	5,070,735
08/27/1999	12:20	11,766	295.46	12.79	281.1	29,920,893	265.32	22.89	396.0	5,074,695
08/27/1999	12:30	11,776	295.85	12.40	281.1	29,923,704	265.36	22.85	396.0	5,078,655
08/27/1999	12:40	11,786	295.33	12.92	281.1	29,926,514	264.63	23.58	396.0	5,082,615
08/27/1999	12:50	11,796	295.99	12.26	281.1	29,929,325	264.85	23.36	396.0	5,086,575
08/27/1999	13:00	11,806	295.39	12.86	281.1	29,932,136	264.60	23.61	396.0	5,090,535
08/27/1999	13:10	11,816	295.35	12.90	281.1	29,934,946	264.62	23.59	396.0	5,094,495
08/27/1999	13:20	11,826	295.73	12.51	281.1	29,937,757	264.71	23.51	396.0	5,098,456
08/27/1999	13:30	11,836	295.37	12.87	281.1	29,940,568	264.24	23.97	396.0	5,102,416
08/27/1999	13:40	11,846	295.52	12.73	281.1	29,943,378	264.23	23.98	396.0	5,106,376
08/27/1999	13:50	11,856	295.68	12.57	281.1	29,946,189	264.80	23.41	396.0	5,110,336
08/27/1999	14:00	11,866	295.58	12.67	281.1	29,949,000	264.71	23.50	396.0	5,114,296
08/27/1999	14:10	11,876	295.29	12.96	281.1	29,951,810	264.73	23.48	396.0	5,118,256
08/27/1999	14:20	11,886	295.71	12.54	281.1	29,954,621	264.55	23.66	396.0	5,122,216
08/27/1999	14:30	11,896	295.36	12.89	281.1	29,957,432	264.53	23.68	396.0	5,126,176
08/27/1999	14:40	11,906	295.29	12.96	281.1	29,960,242	264.29	23.92	396.0	5,130,136
08/27/1999	14:50	11,916	295.35	12.90	281.1	29,963,053	264.45	23.76	396.0	5,134,096
08/27/1999	15:00	11,926	295.43	12.82	281.1	29,965,864	264.36	23.85	396.0	5,138,056
08/27/1999	15:10	11,936	295.89	12.36	281.1	29,968,674	264.53	23.68	396.0	5,142,016
08/27/1999	15:20	11,946	295.42	12.83	281.1	29,971,485	264.61	23.60	396.0	5,145,976
08/27/1999	15:30	11,956	295.04	13.21	281.1	29,974,295	264.56	23.65	396.0	5,149,936
08/27/1999	15:40	11,966	295.71	12.54	281.1	29,977,106	264.70	23.51	396.0	5,153,896
08/27/1999	15:50	11,976	295.72	12.53	281.1	29,979,917	264.54	23.67	396.0	5,157,856
08/27/1999	16:00	11,986	295.16	13.09	281.1	29,982,727	264.70	23.51	396.0	5,161,816
08/27/1999	16:10	11,996	295.68	12.57	281.1	29,985,538	264.50	23.71	396.0	5,165,776
08/27/1999	16:20	12,006	295.10	13.15	281.1	29,988,349	264.74	23.47	396.0	5,169,736
08/27/1999	16:30	12,016	295.79	12.46	281.1	29,991,159	264.48	23.73	396.0	5,173,696
08/27/1999	16:40	12,026	294.98	13.26	281.1	29,993,970	264.52	23.69	396.0	5,177,656
08/27/1999	16:50	12,036	295.56	12.69	281.1	29,996,781	264.44	23.77	396.0	5,181,616
08/27/1999	17:00	12,046	295.97	12.28	281.1	29,999,591	264.50	23.71	396.0	5,185,576
08/27/1999	17:10	12,056	295.75	12.50	281.1	30,002,402	264.65	23.56	396.0	5,189,536
08/27/1999	17:20	12,066	295.72	12.53	281.1	30,005,213	264.58	23.63	396.0	5,193,496
08/27/1999	17:30	12,076	295.58	12.67	281.1	30,008,023	264.38	23.83	396.0	5,197,456
08/27/1999	17:40	12,086	295.88	12.37	281.1	30,010,834	264.50	23.71	396.0	5,201,416
08/27/1999	17:50	12,096	295.85	12.40	281.1	30,013,645	264.58	23.64	396.0	5,205,376
08/27/1999	18:00	12,106	295.27	12.98	281.1	30,016,455	264.45	23.77	396.0	5,209,336
08/27/1999	18:10	12,116	295.37	12.87	281.1	30,019,266	264.22	23.99	396.0	5,213,296
08/27/1999	18:20	12,126	295.59	12.66	281.1	30,022,077	264.48	23.73	396.0	5,217,256
08/27/1999	18:30	12,136	295.97	12.28	281.1	30,024,887	264.49	23.72	396.0	5,221,216
08/27/1999	18:40	12,146	295.65	12.60	281.1	30,027,698	264.21	24.00	396.0	5,225,176
08/27/1999	18:50	12,156	295.20	13.05	281.1	30,030,508	264.36	23.85	396.0	5,229,136
08/27/1999	19:00	12,166	295.68	12.57	281.1	30,033,319	264.38	23.83	396.0	5,233,096
08/27/1999	19:10	12,176	295.37	12.87	281.1	30,036,130	264.35	23.86	396.0	5,237,056
08/27/1999	19:20	12,186	295.79	12.46	281.1	30,038,940	264.19	24.02	396.0	5,241,016
08/27/1999	19:30	12,196	295.73	12.51	281.1	30,041,751	264.12	24.09	396.0	5,244,976
08/27/1999	19:40	12,206	295.58	12.67	281.1	30,044,562	264.11	24.10	396.0	5,248,937
08/27/1999	19:50	12,216	295.84	12.41	281.1	30,047,372	264.13	24.08	396.0	5,252,897
08/27/1999	20:00	12,226	295.82	12.43	281.1	30,050,183	264.05	24.16	396.0	5,256,857
08/27/1999	20:10	12,236	295.06	13.19	281.1	30,052,994	264.30	23.91	396.0	5,260,817
08/27/1999	20:20	12,246	295.27	12.98	281.1	30,055,804	264.43	23.78	396.0	5,264,777
08/27/1999	20:30	12,256	295.49	12.76	281.1	30,058,615	264.06	24.15	396.0	5,268,737
08/27/1999	20:40	12,266	295.27	12.98	281.1	30,061,426	264.32	23.90	396.0	5,272,697
08/27/1999	20:50	12,276	295.46	12.79	281.1	30,064,236	264.48	23.73	396.0	5,276,657
08/27/1999	21:00	12,286	295.63	12.62	281.1	30,067,047	264.25	23.96	396.0	5,280,617
08/27/1999	21:10	12,296	295.75	12.50	281.1	30,069,858	264.33	23.88	396.0	5,284,577
08/27/1999	21:20	12,306	295.00	13.25	281.1	30,072,668	264.50	23.72	396.0	5,288,537
08/27/1999	21:30	12,316	295.62	12.63	281.1	30,075,479	264.41	23.80	396.0	5,292,497
08/27/1999	21:40	12,326	295.43	12.82	281.1	30,078,290	264.43	23.78	396.0	5,296,457
08/27/1999	21:50	12,336	295.17	13.08	281.1	30,081,100	264.56	23.65	396.0	5,300,417

YIELD TEST LOG

Name of Owner:	University of Connecticut
Address of Owner:	39 LeDoyt Road, Box U-38
	Storrs, CT 06269-3038
Source Designation:	Willimantic River Wellfield
	Well #3 & Well #4
Person Conducting Test:	Christopher Till, P.E.
Firm:	Lenard Engineering, Inc.
Address of Firm:	1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/27/1999	22:00	12,346	295.32	12.93	281.1	30,083,911	264.36	23.85	396.0	5,304,377
08/27/1999	22:10	12,356	295.13	13.12	281.1	30,086,721	264.12	24.09	396.0	5,308,337
08/27/1999	22:20	12,366	295.71	12.54	281.1	30,089,532	264.24	23.97	396.0	5,312,297
08/27/1999	22:30	12,376	295.03	13.22	281.1	30,092,343	264.15	24.06	396.0	5,316,257
08/27/1999	22:40	12,386	295.17	13.08	281.1	30,095,153	264.17	24.04	396.0	5,320,217
08/27/1999	22:50	12,396	295.20	13.05	281.1	30,097,964	264.02	24.20	396.0	5,324,177
08/27/1999	23:00	12,406	295.17	13.08	281.1	30,100,775	264.27	23.94	396.0	5,328,137
08/27/1999	23:10	12,416	295.20	13.05	281.1	30,103,585	263.99	24.22	396.0	5,332,097
08/27/1999	23:20	12,426	295.59	12.66	281.1	30,106,396	263.86	24.36	396.0	5,336,057
08/27/1999	23:30	12,436	295.39	12.86	281.1	30,109,207	264.14	24.07	396.0	5,340,017
08/27/1999	23:40	12,446	295.07	13.18	281.1	30,112,017	263.67	24.54	396.0	5,343,977
08/27/1999	23:50	12,456	295.59	12.66	281.1	30,114,828	263.90	24.31	396.0	5,347,937
08/28/1999	0:00	12,466	295.32	12.93	281.1	30,117,639	263.91	24.30	396.0	5,351,897
08/28/1999	0:10	12,476	295.47	12.77	281.1	30,120,449	264.14	24.08	396.0	5,355,857
08/28/1999	0:20	12,486	295.37	12.87	281.1	30,123,260	264.11	24.10	396.0	5,359,817
08/28/1999	0:30	12,496	295.35	12.90	281.1	30,126,071	264.07	24.14	396.0	5,363,777
08/28/1999	0:40	12,506	295.09	13.16	281.1	30,128,881	264.20	24.01	396.0	5,367,737
08/28/1999	0:50	12,516	295.52	12.73	281.1	30,131,692	264.15	24.06	396.0	5,371,697
08/28/1999	1:00	12,526	295.01	13.24	281.1	30,134,503	264.09	24.12	396.0	5,375,657
08/28/1999	1:10	12,536	295.59	12.66	281.1	30,137,313	264.13	24.08	396.0	5,379,617
08/28/1999	1:20	12,546	295.46	12.79	281.1	30,140,124	264.18	24.03	396.0	5,383,577
08/28/1999	1:30	12,556	295.29	12.96	281.1	30,142,935	263.99	24.23	396.0	5,387,537
08/28/1999	1:40	12,566	295.62	12.63	281.1	30,145,745	263.96	24.25	396.0	5,391,497
08/28/1999	1:50	12,576	295.71	12.54	281.1	30,148,556	264.08	24.13	396.0	5,395,457
08/28/1999	2:00	12,586	295.65	12.60	281.1	30,151,366	263.87	24.34	396.0	5,399,418
08/28/1999	2:10	12,596	295.72	12.53	281.1	30,154,177	264.08	24.13	396.0	5,403,378
08/28/1999	2:20	12,606	294.94	13.31	281.1	30,156,988	264.13	24.08	396.0	5,407,338
08/28/1999	2:30	12,616	295.33	12.92	281.1	30,159,798	264.04	24.17	396.0	5,411,298
08/28/1999	2:40	12,626	295.62	12.63	281.1	30,162,609	263.82	24.39	396.0	5,415,258
08/28/1999	2:50	12,636	295.52	12.73	281.1	30,165,420	263.83	24.38	396.0	5,419,218
08/28/1999	3:00	12,646	295.49	12.76	281.1	30,168,230	263.99	24.22	396.0	5,423,178
08/28/1999	3:10	12,656	294.93	13.32	281.1	30,171,041	264.13	24.08	396.0	5,427,138
08/28/1999	3:20	12,666	295.46	12.79	281.1	30,173,852	263.95	24.26	396.0	5,431,098
08/28/1999	3:30	12,676	295.59	12.66	281.1	30,176,662	263.77	24.44	396.0	5,435,058
08/28/1999	3:40	12,686	295.42	12.83	281.1	30,179,473	263.90	24.31	396.0	5,439,018
08/28/1999	3:50	12,696	295.45	12.80	281.1	30,182,284	264.13	24.08	396.0	5,442,978
08/28/1999	4:00	12,706	295.53	12.72	281.1	30,185,094	264.01	24.20	396.0	5,446,938
08/28/1999	4:10	12,716	294.91	13.34	281.1	30,187,905	264.08	24.13	396.0	5,450,898
08/28/1999	4:20	12,726	295.55	12.70	281.1	30,190,716	264.23	23.98	396.0	5,454,858
08/28/1999	4:30	12,736	295.53	12.72	281.1	30,193,526	264.08	24.13	396.0	5,458,818
08/28/1999	4:40	12,746	294.97	13.28	281.1	30,196,337	264.02	24.19	396.0	5,462,778
08/28/1999	4:50	12,756	295.56	12.69	281.1	30,199,148	264.21	24.00	396.0	5,466,738
08/28/1999	5:00	12,766	294.98	13.26	281.1	30,201,958	264.28	23.93	396.0	5,470,698
08/28/1999	5:10	12,776	295.00	13.25	281.1	30,204,769	263.69	24.52	396.0	5,474,658
08/28/1999	5:20	12,786	295.03	13.22	281.1	30,207,579	263.86	24.35	396.0	5,478,618
08/28/1999	5:30	12,796	295.43	12.82	281.1	30,210,390	263.92	24.29	396.0	5,482,578
08/28/1999	5:40	12,806	295.03	13.22	281.1	30,213,201	263.84	24.37	396.0	5,486,538
08/28/1999	5:50	12,816	295.27	12.98	281.1	30,216,011	263.81	24.40	396.0	5,490,498
08/28/1999	6:00	12,826	295.55	12.70	281.1	30,218,822	263.65	24.56	396.0	5,494,458
08/28/1999	6:10	12,836	295.45	12.80	281.1	30,221,633	263.98	24.23	396.0	5,498,418
08/28/1999	6:20	12,846	295.46	12.79	281.1	30,224,443	263.94	24.27	396.0	5,502,378
08/28/1999	6:30	12,856	295.03	13.22	281.1	30,227,254	263.61	24.60	396.0	5,506,338
08/28/1999	6:40	12,866	295.03	13.22	281.1	30,230,065	263.69	24.52	396.0	5,510,298
08/28/1999	6:50	12,876	295.13	13.12	281.1	30,232,875	263.55	24.66	396.0	5,514,258
08/28/1999	7:00	12,886	294.86	13.39	281.1	30,235,686	263.86	24.35	396.0	5,518,218
08/28/1999	7:10	12,896	294.81	13.44	281.1	30,238,497	263.88	24.33	396.0	5,522,178
08/28/1999	7:20	12,906	295.26	12.99	281.1	30,241,307	264.01	24.20	396.0	5,526,138
08/28/1999	7:30	12,916	294.97	13.28	281.1	30,244,118	263.80	24.41	396.0	5,530,098
08/28/1999	7:40	12,926	295.32	12.93	281.1	30,246,929	263.69	24.52	396.0	5,534,058

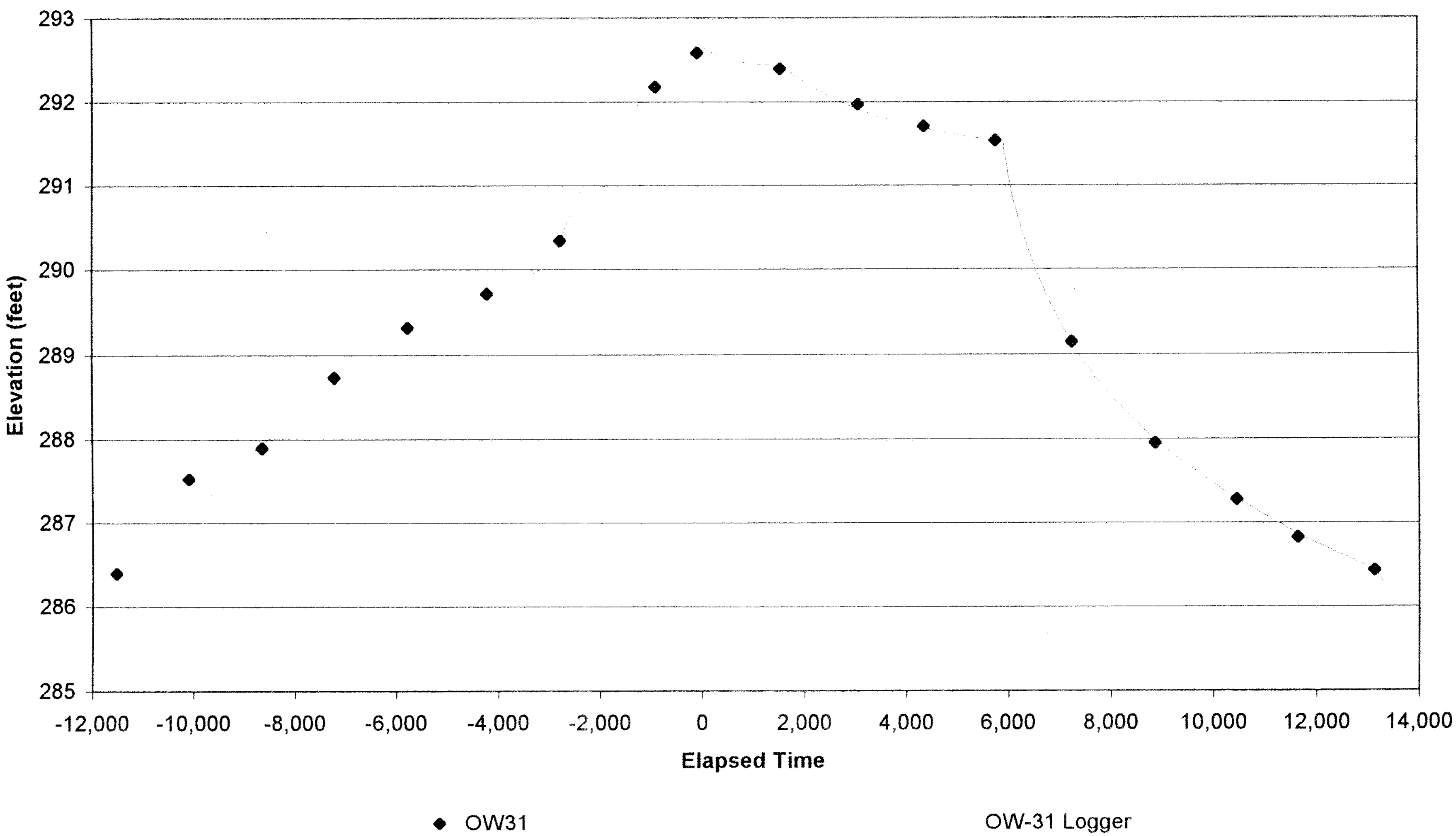
YIELD TEST LOG

Name of Owner: University of Connecticut
Address of Owner: 39 LeDoyt Road, Box U-38
Storrs, CT 06269-3038
Source Designation: Willimantic River Wellfield
Well #3 & Well #4
Person Conducting Test: Christopher Till, P.E.
Firm: Lenard Engineering, Inc.
Address of Firm: 1066 Storrs Road, P.O. Box 580, Storrs, CT 06268

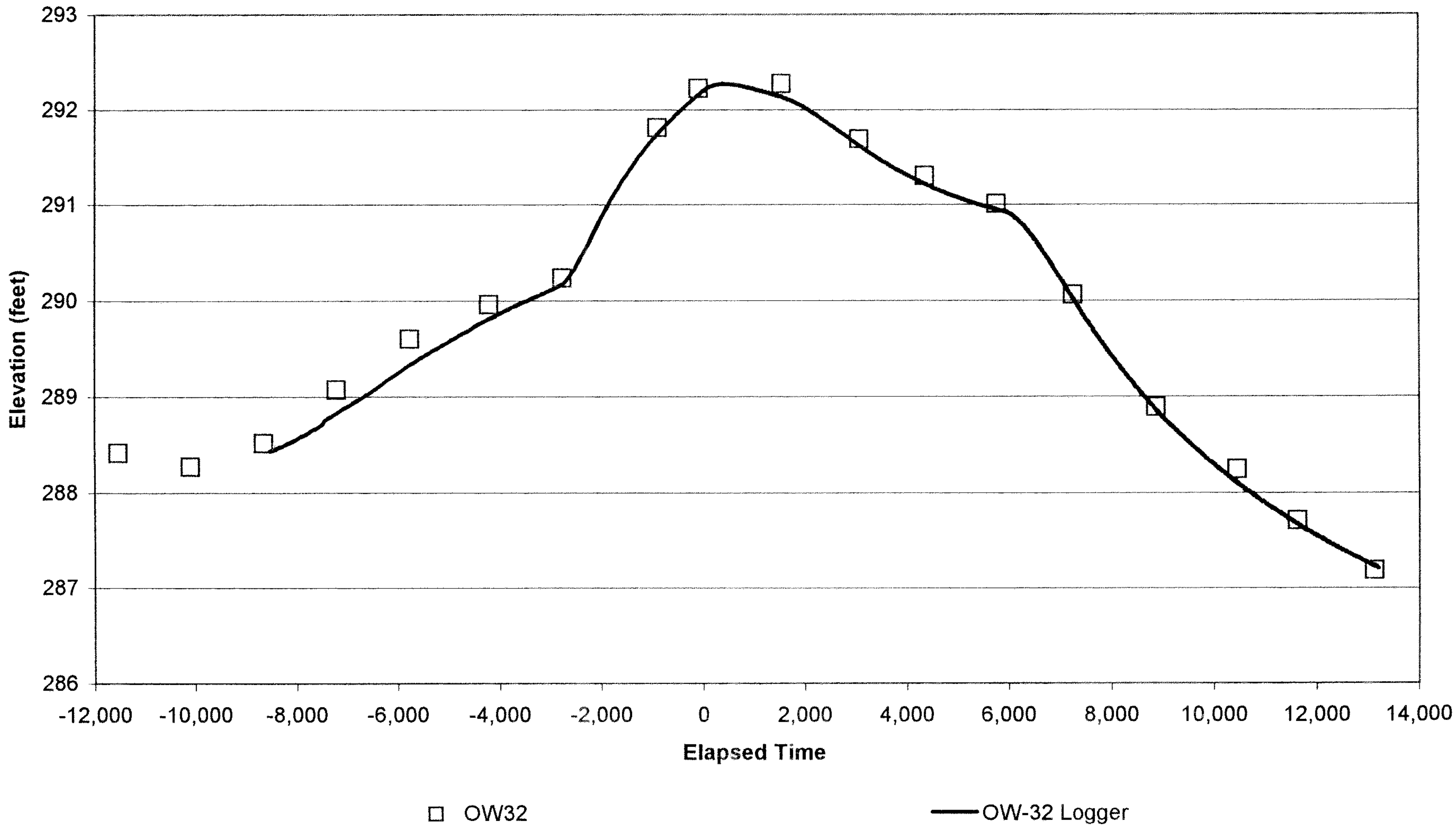
Date	Time	ET (min)	WELL 3 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)	WELL 4 Water Level Elevation (ft)	Drawdown (feet)	Pumping Rate (gpm)	Totalizer (gallons)
08/28/1999	7:50	12,936	295.33	12.92	281.1	30,249,739	263.85	24.36	396.0	5,538,018
08/28/1999	8:00	12,946	294.87	13.38	281.1	30,252,550	263.76	24.45	396.0	5,541,978
08/28/1999	8:10	12,956	295.10	13.15	281.1	30,255,361	263.79	24.42	396.0	5,545,938
08/28/1999	8:20	12,966	294.96	13.29	281.1	30,258,171	264.00	24.22	396.0	5,549,899
08/28/1999	8:30	12,976	295.16	13.09	281.1	30,260,982	263.95	24.27	396.0	5,553,859
08/28/1999	8:40	12,986	295.01	13.24	281.1	30,263,792	263.82	24.39	396.0	5,557,819
08/28/1999	8:50	12,996	294.97	13.28	281.1	30,266,603	263.65	24.57	396.0	5,561,779
08/28/1999	9:00	13,006	295.39	12.86	281.1	30,269,414	263.72	24.49	396.0	5,565,739
08/28/1999	9:10	13,016	295.24	13.00	281.1	30,272,224	263.69	24.52	396.0	5,569,699
08/28/1999	9:20	13,026	295.58	12.67	281.1	30,275,035	263.92	24.29	396.0	5,573,659
08/28/1999	9:30	13,036	295.32	12.93	281.1	30,277,846	264.09	24.12	396.0	5,577,619
08/28/1999	9:40	13,046	295.37	12.87	281.1	30,280,656	264.10	24.11	396.0	5,581,579
08/28/1999	9:50	13,056	294.88	13.37	281.1	30,283,467	263.99	24.22	396.0	5,585,539
08/28/1999	10:00	13,066	295.59	12.66	281.1	30,286,278	263.91	24.30	396.0	5,589,499
08/28/1999	10:10	13,076	295.23	13.02	281.1	30,289,088	263.82	24.39	396.0	5,593,459
08/28/1999	10:20	13,086	294.91	13.34	281.1	30,291,899	263.86	24.35	396.0	5,597,419
08/28/1999	10:30	13,096	295.43	12.82	281.1	30,294,710	263.95	24.26	396.0	5,601,379
08/28/1999	10:40	13,106	295.01	13.24	281.1	30,297,520	264.08	24.13	396.0	5,605,339
08/28/1999	10:50	13,116	295.43	12.82	281.1	30,300,331	263.88	24.33	396.0	5,609,299
08/28/1999	11:00	13,126	295.53	12.72	281.1	30,303,142	263.99	24.22	396.0	5,613,259
08/28/1999	11:10	13,136	295.52	12.73	281.1	30,305,952	263.97	24.24	396.0	5,617,219
08/28/1999	11:20	13,146	295.13	13.12	281.1	30,308,763	263.86	24.36	396.0	5,621,179
08/28/1999	11:30	13,156	295.19	13.06	281.1	30,311,574	264.24	23.97	396.0	5,625,139
08/28/1999	11:40	13,166	295.43	12.82	281.1	30,314,384	264.11	24.10	396.0	5,629,099
08/28/1999	11:50	13,176	295.60	12.64	281.1	30,317,195	264.09	24.12	396.0	5,633,059
08/28/1999	12:00	13,186	295.24	13.00	281.1	30,320,006				
08/28/1999	12:10	13,196	295.36	12.89	281.1	30,322,816				

C

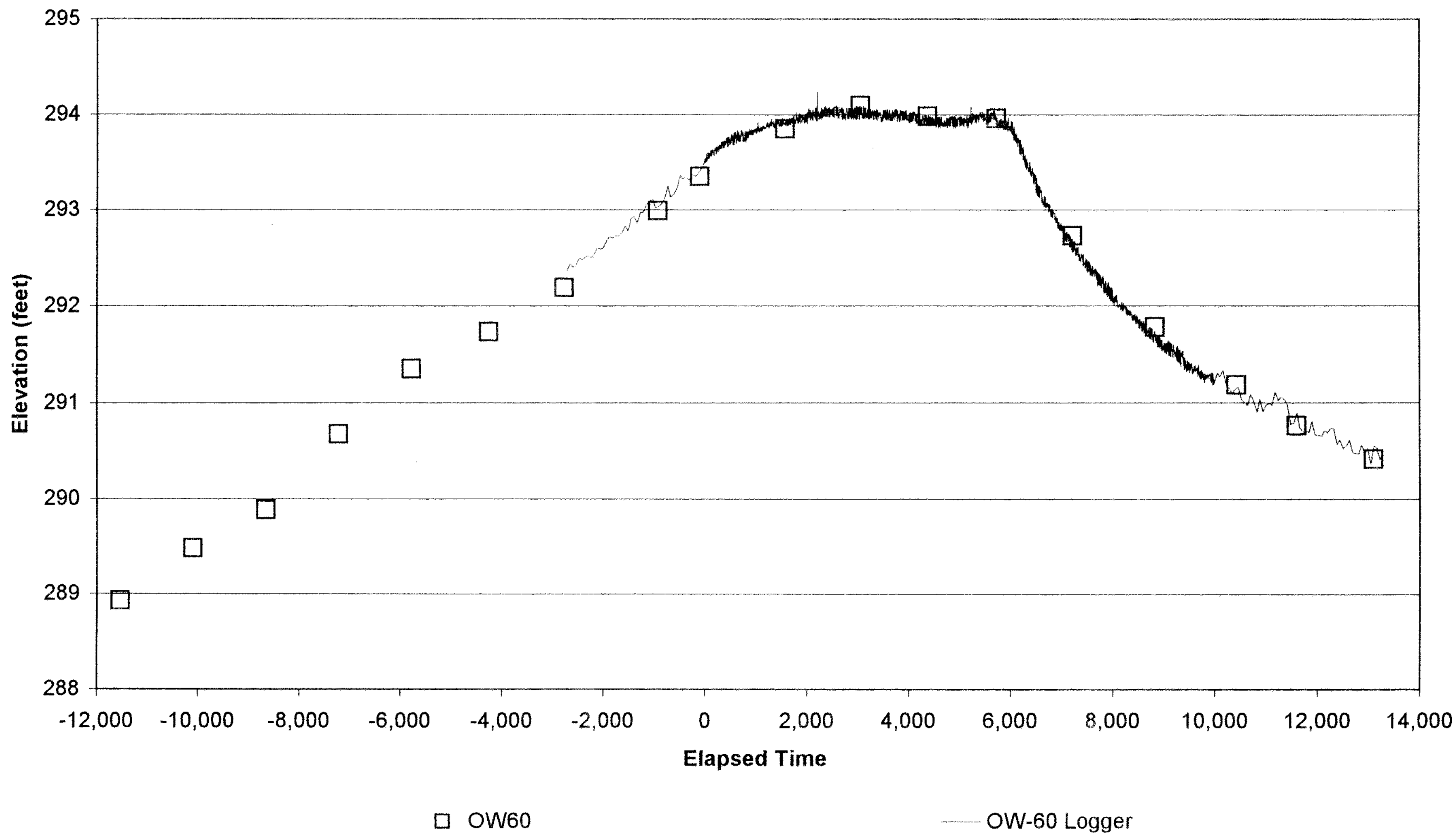
Monitoring Well Water Elevations



Monitoring Well Water Elevations



Monitoring Well Water Elevations



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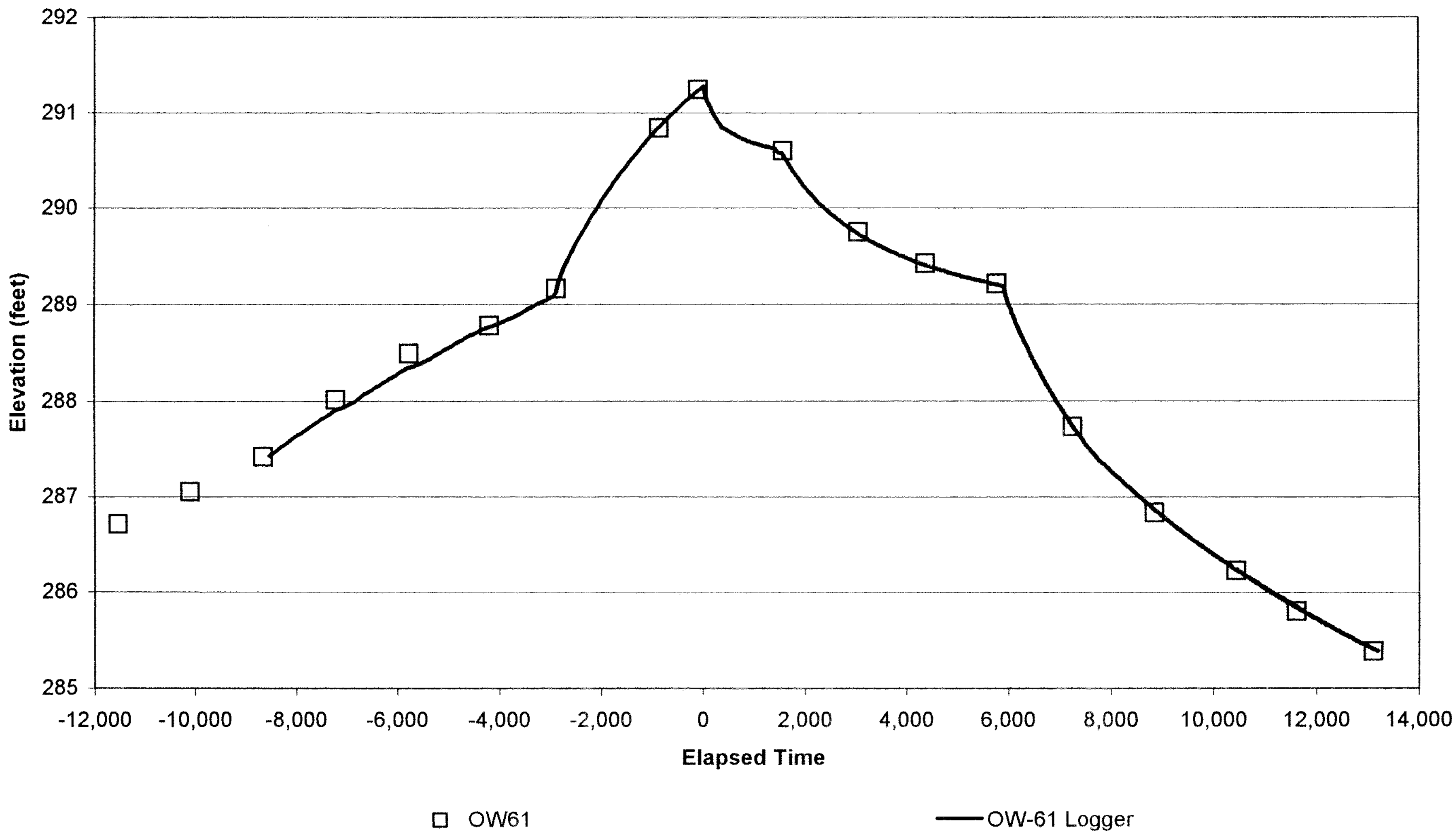

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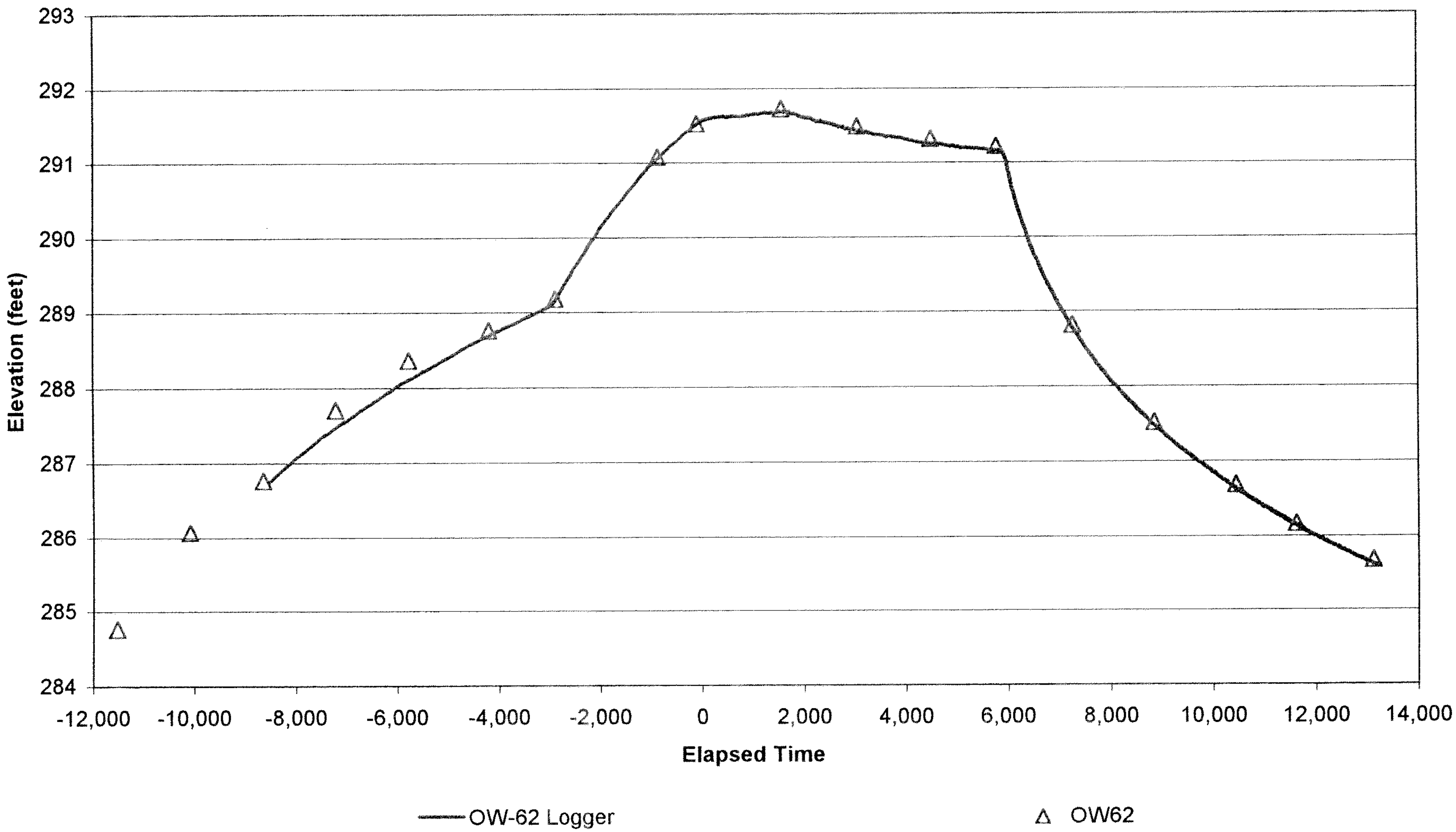

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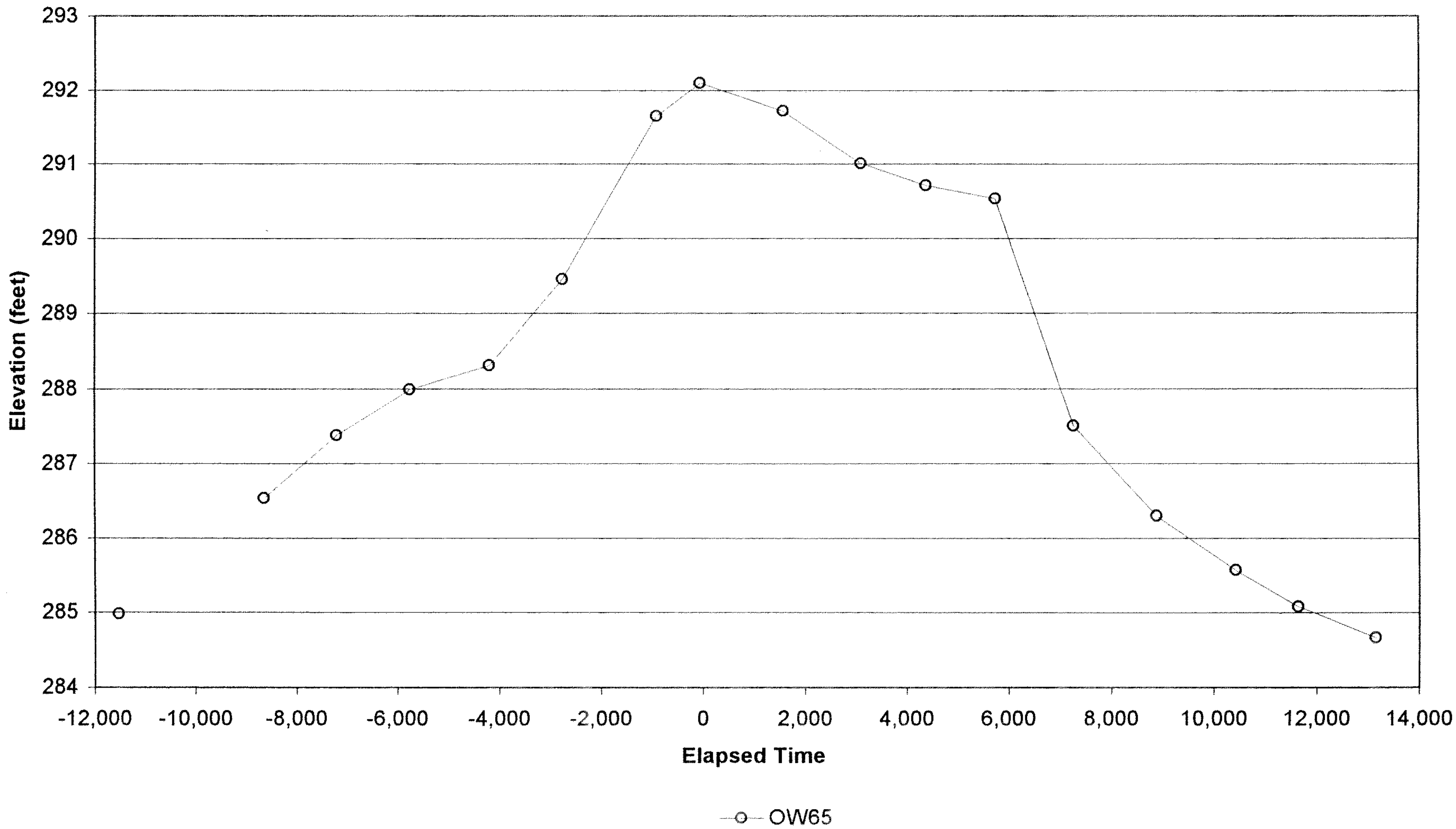

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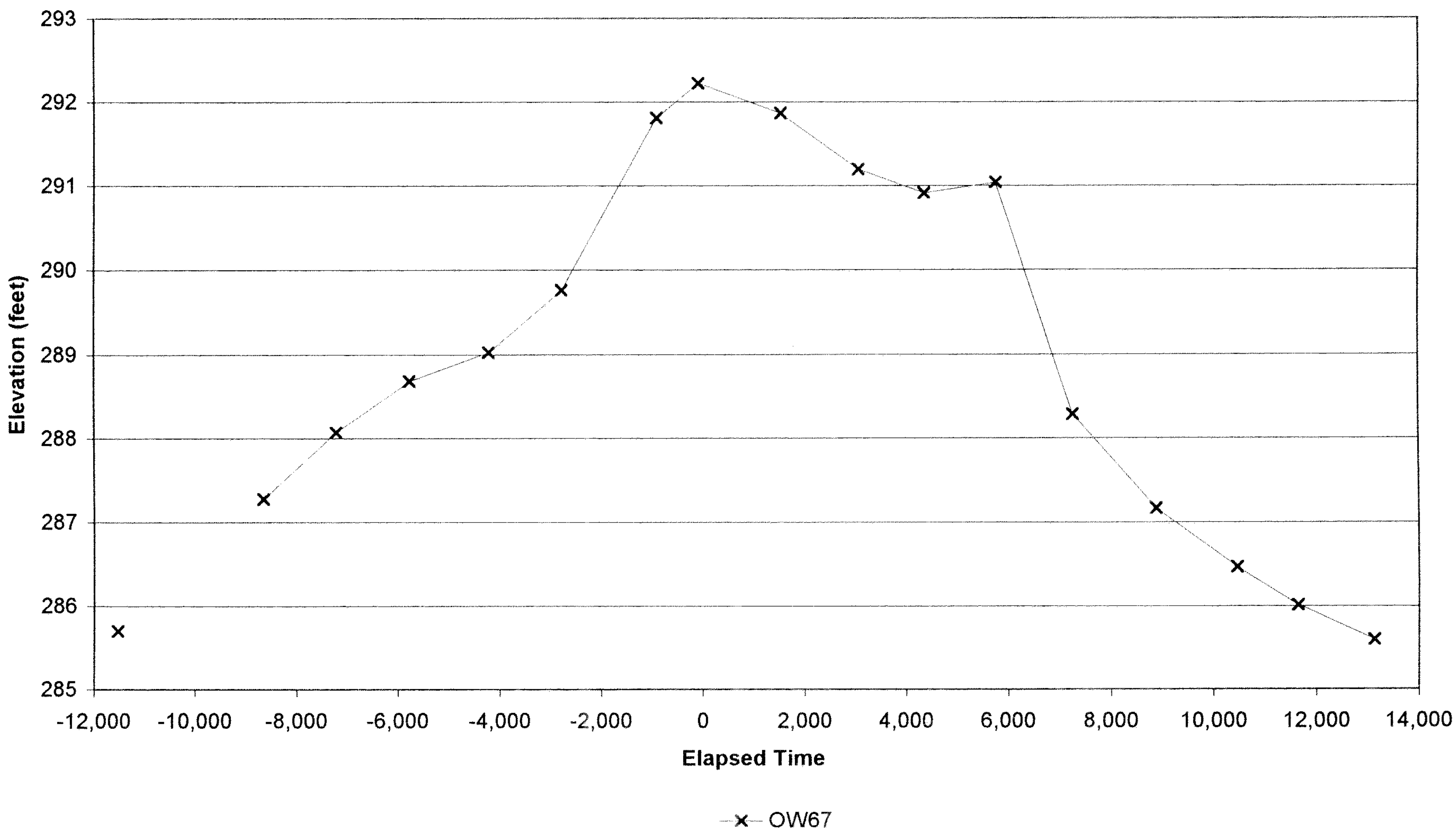

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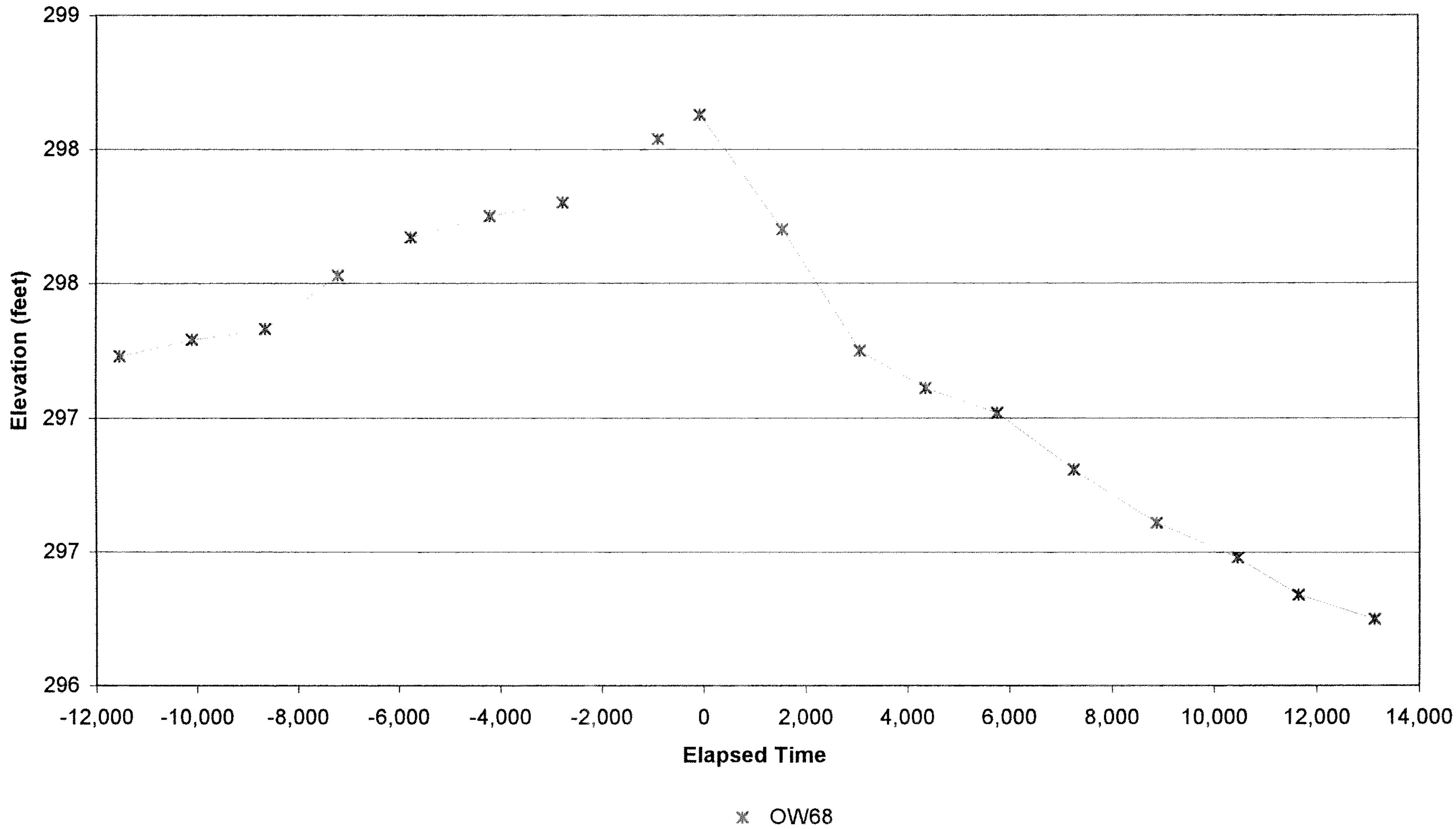

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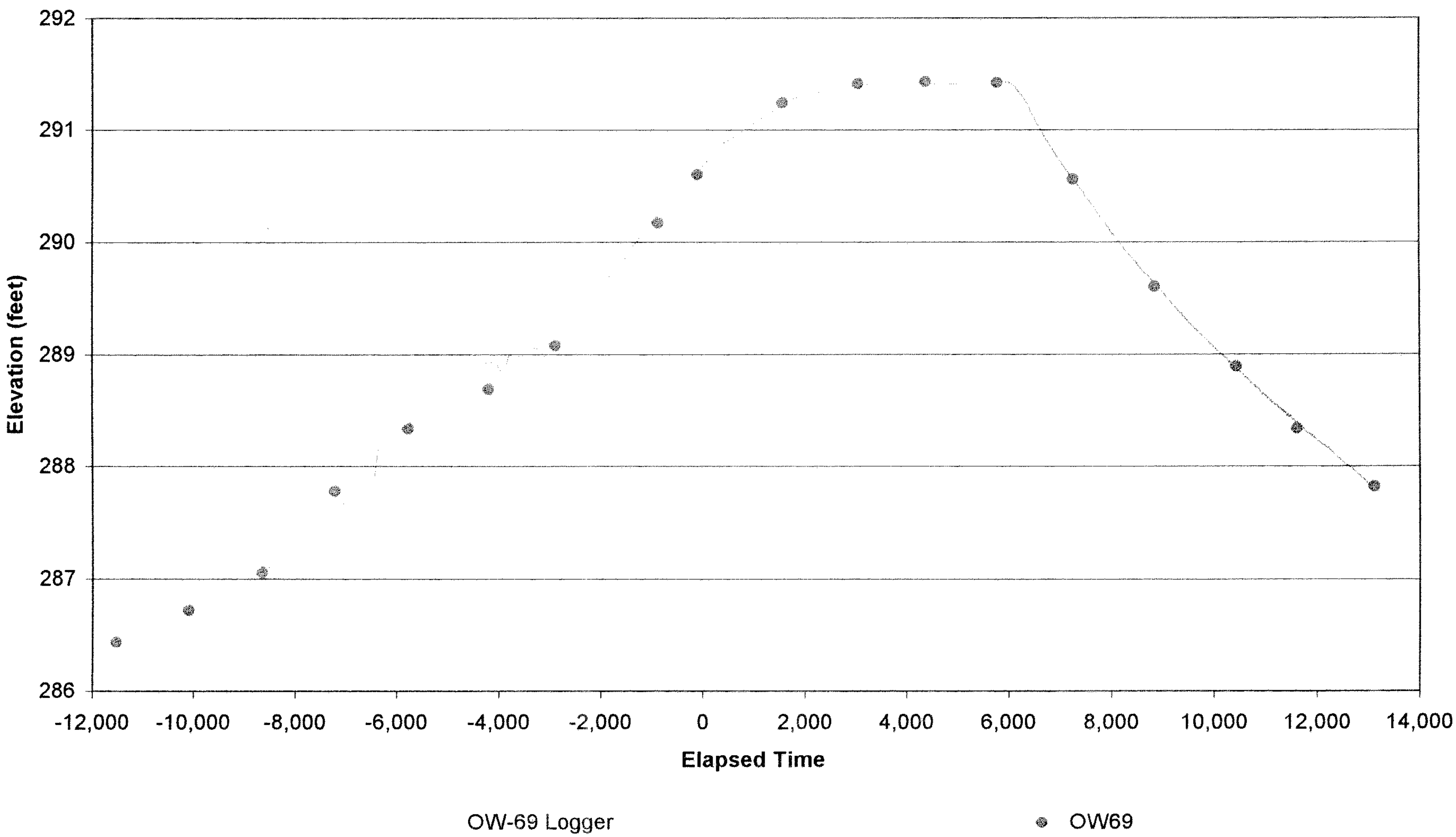
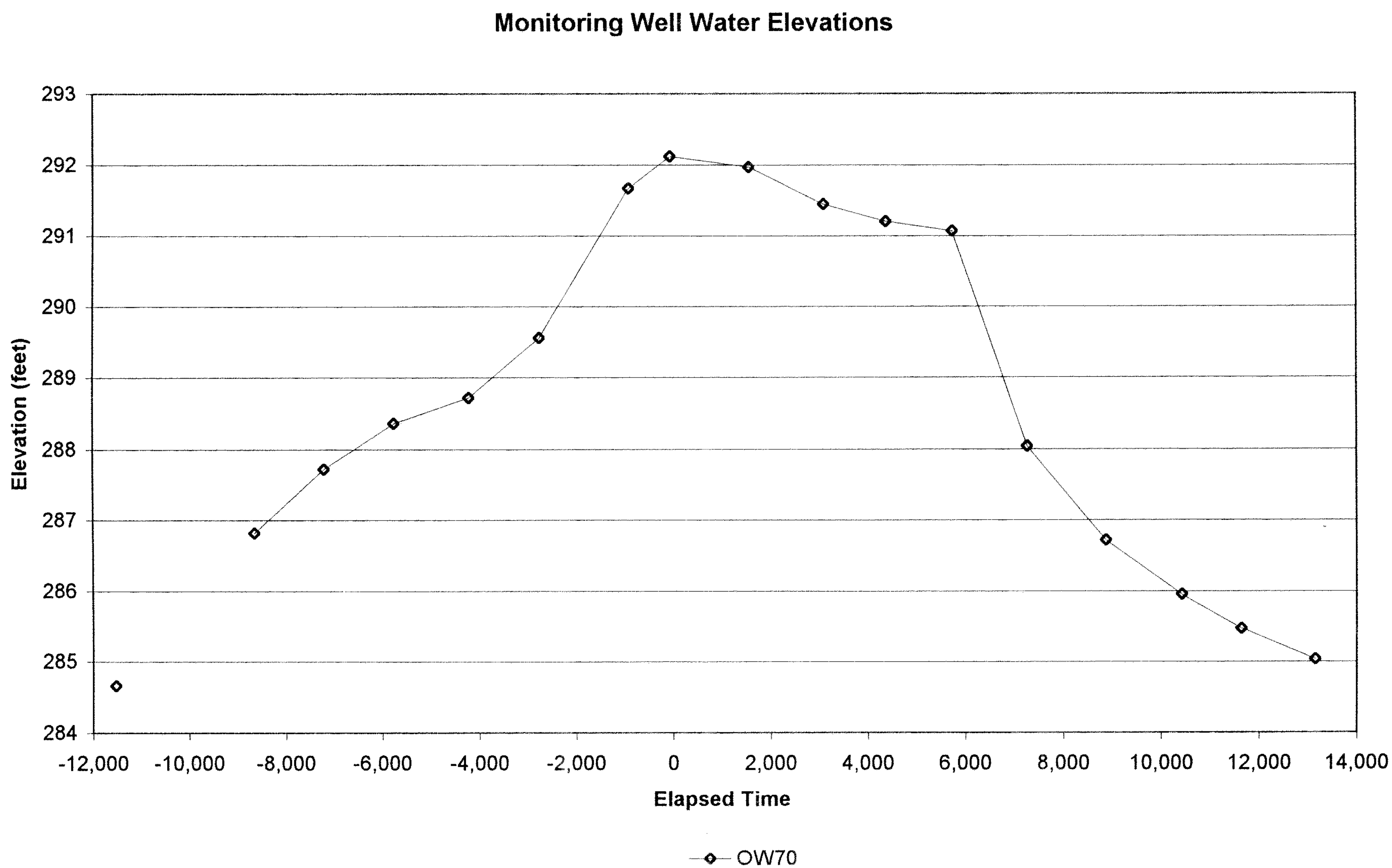



Monitoring Well Water Elevations
293
292
291
290
289
288
287
286
285
284
Elevation (feet)
-12,000
-10,000
-8,000
-6,000
-4,000
-2,000
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
Elapsed Time
OW70

D

Manual Well Data

Date	Time	Elapsed Time	OW31 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	15.00	286.39	6.19
08/12/1999	8:00	(10,095)	13.87	287.52	5.06
08/13/1999	8:00	(8,655)	13.50	287.89	4.69
08/14/1999	8:00	(7,215)	12.66	288.73	3.85
08/15/1999	8:00	(5,775)	12.08	289.31	3.27
08/16/1999	9:58	(4,217)	11.68	289.71	2.87
08/17/1999	9:58	(2,777)	11.05	290.34	2.24
08/18/1999	17:10	(905)	9.21	292.18	0.40
08/19/1999	6:45	(90)	8.81	292.58	0.00
08/20/1999	9:55	1,540	9.00	292.39	0.19
08/21/1999	11:20	3,065	9.42	291.97	0.61
08/22/1999	8:50	4,355	9.68	291.71	0.87
08/23/1999	8:10	5,755	9.85	291.54	1.04
08/24/1999	9:10	7,255	12.25	289.14	3.44
08/25/1999	12:10	8,875	13.44	287.95	4.63
08/26/1999	14:30	10,455	14.12	287.27	5.31
08/27/1999	10:10	11,635	14.57	286.82	5.76
08/28/1999	11:05	13,130	14.96	286.43	6.15

Manual Well Data

Date	Time	Elapsed Time	OW32 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	11.95	288.41	3.81
08/12/1999	8:00	(10,095)	12.09	288.27	3.95
08/13/1999	8:00	(8,655)	11.85	288.51	3.71
08/14/1999	8:00	(7,215)	11.29	289.07	3.15
08/15/1999	8:00	(5,775)	10.76	289.60	2.62
08/16/1999	9:58	(4,217)	10.4	289.96	2.26
08/17/1999	9:58	(2,777)	10.12	290.24	1.98
08/18/1999	17:10	(905)	8.55	291.81	0.41
08/19/1999	6:45	(90)	8.14	292.22	0.00
08/20/1999	9:55	1,540	8.09	292.27	-0.05
08/21/1999	11:20	3,065	8.67	291.69	0.53
08/22/1999	8:50	4,355	9.06	291.30	0.92
08/23/1999	8:10	5,755	9.35	291.01	1.21
08/24/1999	9:10	7,255	10.3	290.06	2.16
08/25/1999	12:10	8,875	11.47	288.89	3.33
08/26/1999	14:30	10,455	12.12	288.24	3.98
08/27/1999	10:10	11,635	12.65	287.71	4.51
08/28/1999	11:05	13,130	13.17	287.19	5.03

Manual Well Data

Date	Time	Elapsed Time	OW45 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)			
08/12/1999	8:00	(10,095)			
08/13/1999	8:00	(8,655)			
08/14/1999	8:00	(7,215)			
08/15/1999	8:00	(5,775)			
08/16/1999	8:00	(4,335)			
08/17/1999	8:00	(2,895)			
08/18/1999	16:45	(930)	14.28	291.10	0.03
08/19/1999	0:700	205	14.25	291.13	0.00
08/20/1999	8:00	1,425	14.21	291.17	-0.04
08/21/1999	11:35	3,080	14.26	291.12	0.01
08/22/1999	9:00	4,365	14.22	291.16	-0.03
08/23/1999	7:40	5,725	14.25	291.13	0.00
08/24/1999	9:15	7,260	14.29	291.09	0.04
08/25/1999	11:30	8,835	14.35	291.03	0.10
08/26/1999	14:00	10,425	14.31	291.07	0.06
08/27/1999	9:35	11,600	14.34	291.04	0.09
08/28/1999	11:25	13,150	14.27	291.11	0.02

Manual Well Data

Date	Time	Elapsed Time	OW48 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	8.30	292.14	0.47
08/12/1999	8:00	(10,095)	8.24	292.20	0.41
08/13/1999	8:00	(8,655)	8.25	292.19	0.42
08/14/1999	8:00	(7,215)	8.09	292.35	0.26
08/15/1999	8:00	(5,775)	7.93	292.51	0.10
08/16/1999	10:09	(4,206)	7.9	292.54	0.07
08/17/1999	6:45	(2,970)	7.93	292.51	0.10
08/18/1999	16:20	(955)	7.87	292.57	0.04
08/19/1999	7:30	(45)	7.83	292.61	0.00
08/20/1999	8:30	1,455	8.05	292.39	0.22
08/21/1999	10:30	3,015	8.23	292.21	0.40
08/22/1999	9:40	4,405	8.29	292.15	0.46
08/23/1999	9:40	5,845	8.36	292.08	0.53
08/24/1999	10:37	7,342	8.37	292.07	0.54
08/25/1999	12:30	8,895	8.60	291.84	0.77
08/26/1999	13:30	10,395	8.67	291.77	0.84
08/27/1999	11:05	11,690	8.75	291.69	0.92
08/28/1999	10:00	13,065	8.78	291.66	0.95

Manual Well Data

Date	Time	Elapsed Time	OW49 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)			291.93
08/12/1999	8:00	(10,095)			291.93
08/13/1999	8:00	(8,655)			291.93
08/14/1999	8:00	(7,215)	7.65	291.86	0.07
08/15/1999	8:00	(5,775)	7.45	292.06	-0.13
08/16/1999	8:00	(4,335)			291.93
08/17/1999	6:45	(2,970)	7.45	292.06	-0.13
08/18/1999	16:10	(965)	7.58	291.93	0.00
08/19/1999	7:30	(45)	7.58	291.93	0.00
08/20/1999	8:30	1,455	7.60	291.91	0.02
08/21/1999	10:30	3,015	7.65	291.86	0.07
08/22/1999	9:40	4,405	7.67	291.84	0.09
08/23/1999	9:40	5,845	7.65	291.86	0.07
08/24/1999	10:37	7,342	7.76	291.75	0.18
08/25/1999	1:00	8,205	7.75	291.76	0.17
08/26/1999	13:30	10,395	7.78	291.73	0.20
08/27/1999	11:05	11,690	7.85	291.66	0.27
08/28/1999	10:00	13,065	7.87	291.64	0.29

Manual Well Data

Date	Time	Elapsed Time	OW50 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	8.90	291.05	0.12
08/12/1999	8:00	(10,095)	8.80	291.15	0.02
08/13/1999	8:00	(8,655)	8.85	291.10	0.07
08/14/1999	8:00	(7,215)	8.79	291.16	0.01
08/15/1999	8:00	(5,775)	8.57	291.38	-0.21
08/16/1999	10:55	(4,160)	8.58	291.37	-0.20
08/17/1999	6:45	(2,970)	8.66	291.29	-0.12
08/18/1999	16:20	(955)	8.78	291.17	0.00
08/19/1999	7:30	(45)	8.78	291.17	0.00
08/20/1999	8:30	1,455	8.80	291.15	0.02
08/21/1999	10:30	3,015	8.87	291.08	0.09
08/22/1999	9:40	4,405	8.85	291.10	0.07
08/23/1999	9:40	5,845	8.80	291.15	0.02
08/24/1999	10:37	7,342	8.82	291.13	0.04
08/25/1999	1:00	8,205	8.95	291.00	0.17
08/26/1999	13:30	10,395	8.89	291.06	0.11
08/27/1999	11:05	11,690	8.62	291.33	-0.16
08/28/1999	10:00	13,065	8.91	291.04	0.13

Manual Well Data

Date	Time	Elapsed Time	OW51 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	8.45	291.84	0.02
08/12/1999	8:00	(10,095)	8.45	291.84	0.02
08/13/1999	8:00	(8,655)	8.45	291.84	0.02
08/14/1999	8:00	(7,215)	8.42	291.87	-0.01
08/15/1999	8:00	(5,775)	8.21	292.08	-0.22
08/16/1999	10:55	(4,160)	8.23	292.06	-0.20
08/17/1999	6:45	(2,970)	8.29	292.00	-0.14
08/18/1999	16:20	(955)	8.41	291.88	-0.02
08/19/1999	7:30	(45)	8.43	291.86	0.00
08/20/1999	8:30	1,455	8.46	291.83	0.03
08/21/1999	10:30	3,015	8.53	291.76	0.10
08/22/1999	9:40	4,405	8.48	291.81	0.05
08/23/1999	9:40	5,845	8.46	291.83	0.03
08/24/1999	10:37	7,342	8.51	291.78	0.08
08/25/1999	1:00	8,205	8.62	291.67	0.19
08/26/1999	13:30	10,395	8.60	291.69	0.17
08/27/1999	11:05	11,690	8.64	291.65	0.21
08/28/1999	10:00	13,065	8.59	291.70	0.16

Manual Well Data

Date	Time	Elapsed Time	OW60 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	16.85	288.93	4.42
08/12/1999	8:00	(10,095)	16.30	289.48	3.87
08/13/1999	8:00	(8,655)	15.90	289.88	3.47
08/14/1999	8:00	(7,215)	15.11	290.67	2.68
08/15/1999	8:00	(5,775)	14.43	291.35	2.00
08/16/1999	9:30	(4,245)	14.05	291.73	1.62
08/17/1999	10:15	(2,760)	13.59	292.19	1.16
08/18/1999	17:00	(915)	12.79	292.99	0.36
08/19/1999	6:35	(100)	12.43	293.35	0.00
08/20/1999	10:30	1,575	11.93	293.85	-0.50
08/21/1999	11:05	3,050	11.69	294.09	-0.74
08/22/1999	9:10	4,375	11.80	293.98	-0.63
08/23/1999	7:40	5,725	11.82	293.96	-0.61
08/24/1999	8:40	7,225	13.05	292.73	0.62
08/25/1999	11:43	8,848	14.00	291.78	1.57
08/26/1999	14:05	10,430	14.60	291.18	2.17
08/27/1999	9:45	11,610	15.02	290.76	2.59
08/28/1999	10:40	13,105	15.37	290.41	2.94

Manual Well Data

Date	Time	Elapsed Time	OW61 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	15.60	286.71	4.53
08/12/1999	8:00	(10,095)	15.26	287.05	4.19
08/13/1999	8:00	(8,655)	14.90	287.41	3.83
08/14/1999	8:00	(7,215)	14.30	288.01	3.23
08/15/1999	8:00	(5,775)	13.82	288.49	2.75
08/16/1999	10:25	(4,190)	13.53	288.78	2.46
08/17/1999	8:15	(2,880)	13.15	289.16	2.08
08/18/1999	17:45	(870)	11.47	290.84	0.40
08/19/1999	6:40	(95)	11.07	291.24	0.00
08/20/1999	10:25	1,570	11.71	290.60	0.64
08/21/1999	11:10	3,055	12.56	289.75	1.49
08/22/1999	9:05	4,370	12.89	289.42	1.82
08/23/1999	8:30	5,775	13.10	289.21	2.03
08/24/1999	9:20	7,265	14.58	287.73	3.51
08/25/1999	11:50	8,855	15.48	286.83	4.41
08/26/1999	14:15	10,440	16.08	286.23	5.01
08/27/1999	9:55	11,620	16.51	285.80	5.44
08/28/1999	10:50	13,115	16.92	285.39	5.85

Manual Well Data

Date	Time	Elapsed Time	OW62 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	17.30	284.77	6.76
08/12/1999	8:00	(10,095)	16.00	286.07	5.46
08/13/1999	8:00	(8,655)	15.30	286.77	4.76
08/14/1999	8:00	(7,215)	14.36	287.71	3.82
08/15/1999	8:00	(5,775)	13.71	288.36	3.17
08/16/1999	10:25	(4,190)	13.31	288.76	2.77
08/17/1999	8:15	(2,880)	12.89	289.18	2.35
08/18/1999	17:45	(870)	10.99	291.08	0.45
08/19/1999	6:40	(95)	10.54	291.53	0.00
08/20/1999	10:25	1,570	10.34	291.73	-0.20
08/21/1999	11:10	3,055	10.58	291.49	0.04
08/22/1999	11:10	4,495	10.75	291.32	0.21
08/23/1999	8:30	5,775	10.85	291.22	0.31
08/24/1999	9:20	7,265	13.25	288.82	2.71
08/25/1999	11:50	8,855	14.55	287.52	4.01
08/26/1999	14:15	10,440	15.38	286.69	4.84
08/27/1999	9:55	11,620	15.90	286.17	5.36
08/28/1999	10:50	13,115	16.39	285.68	5.85

Manual Well Data

Date	Time	Elapsed Time	OW65 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	16.30	284.98	7.12
08/12/1999	8:00	(10,095)			
08/13/1999	8:00	(8,655)	14.75	286.53	5.57
08/14/1999	8:00	(7,215)	13.90	287.38	4.72
08/15/1999	8:00	(5,775)	13.29	287.99	4.11
08/16/1999	10:15	(4,200)	12.97	288.31	3.79
08/17/1999	10:10	(2,765)	11.82	289.46	2.64
08/18/1999	16:45	(930)	9.63	291.65	0.45
08/19/1999	7:00	(75)	9.18	292.10	0.00
08/20/1999	10:15	1,560	9.56	291.72	0.38
08/21/1999	11:35	3,080	10.27	291.01	1.09
08/22/1999	9:00	4,365	10.57	290.71	1.39
08/23/1999	7:40	5,725	10.75	290.53	1.57
08/24/1999	9:15	7,260	13.77	287.51	4.59
08/25/1999	12:17	8,882	14.98	286.30	5.80
08/26/1999	14:00	10,425	15.71	285.57	6.53
08/27/1999	10:15	11,640	16.20	285.08	7.02
08/28/1999	11:25	13,150	16.61	284.67	7.43

Manual Well Data

Date	Time	Elapsed Time	OW67 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	15.67	285.70	6.52
08/12/1999	8:00	(10,095)			
08/13/1999	8:00	(8,655)	14.10	287.27	4.95
08/14/1999	8:00	(7,215)	13.30	288.07	4.15
08/15/1999	8:00	(5,775)	12.69	288.68	3.54
08/16/1999	10:00	(4,215)	12.35	289.02	3.20
08/17/1999	9:58	(2,777)	11.61	289.76	2.46
08/18/1999	17:10	(905)	9.56	291.81	0.41
08/19/1999	6:45	(90)	9.15	292.22	0.00
08/20/1999	9:55	1,540	9.50	291.87	0.35
08/21/1999	11:20	3,065	10.17	291.20	1.02
08/22/1999	8:50	4,355	10.46	290.91	1.31
08/23/1999	8:10	5,755	10.33	291.04	1.18
08/24/1999	9:10	7,255	13.09	288.28	3.94
08/25/1999	12:10	8,875	14.21	287.16	5.06
08/26/1999	14:30	10,455	14.90	286.47	5.75
08/27/1999	10:10	11,635	15.36	286.01	6.21
08/28/1999	11:05	13,130	15.77	285.60	6.62

Manual Well Data

Date	Time	Elapsed Time	OW68 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	6.42	297.23	0.90
08/12/1999	8:00	(10,095)	6.36	297.29	0.84
08/13/1999	8:00	(8,655)	6.32	297.33	0.80
08/14/1999	8:00	(7,215)	6.12	297.53	0.60
08/15/1999	8:00	(5,775)	5.98	297.67	0.46
08/16/1999	10:05	(4,210)	5.90	297.75	0.38
08/17/1999	9:58	(2,777)	5.85	297.80	0.33
08/18/1999	17:10	(905)	5.61	298.04	0.09
08/19/1999	6:45	(90)	5.52	298.13	0.00
08/20/1999	9:55	1,540	5.95	297.70	0.43
08/21/1999	11:20	3,065	6.40	297.25	0.88
08/22/1999	8:50	4,355	6.54	297.11	1.02
08/23/1999	8:10	5,755	6.63	297.02	1.11
08/24/1999	9:10	7,255	6.84	296.81	1.32
08/25/1999	12:10	8,875	7.04	296.61	1.52
08/26/1999	14:30	10,455	7.17	296.48	1.65
08/27/1999	10:10	11,635	7.31	296.34	1.79
08/28/1999	11:05	13,130	7.40	296.25	1.88

Manual Well Data

Date	Time	Elapsed Time	OW69 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	17.90	286.44	4.16
08/12/1999	8:00	(10,095)	17.62	286.72	3.88
08/13/1999	8:00	(8,655)	17.28	287.06	3.54
08/14/1999	8:00	(7,215)	16.56	287.78	2.82
08/15/1999	8:00	(5,775)	16.00	288.34	2.26
08/16/1999	10:25	(4,190)	15.65	288.69	1.91
08/17/1999	8:15	(2,880)	15.26	289.08	1.52
08/18/1999	17:45	(870)	14.17	290.17	0.43
08/19/1999	6:40	(95)	13.74	290.60	0.00
08/20/1999	10:25	1,570	13.10	291.24	-0.64
08/21/1999	11:10	3,055	12.93	291.41	-0.81
08/22/1999	9:05	4,370	12.91	291.43	-0.83
08/23/1999	8:30	5,775	12.92	291.42	-0.82
08/24/1999	9:20	7,265	13.78	290.56	0.04
08/25/1999	11:50	8,855	14.74	289.60	1.00
08/26/1999	14:15	10,440	15.45	288.89	1.71
08/27/1999	9:55	11,620	16.00	288.34	2.26
08/28/1999	10:50	13,115	16.52	287.82	2.78

Manual Well Data

Date	Time	Elapsed Time	OW70 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)	15.70	284.67	7.45
08/12/1999	8:00	(10,095)			
08/13/1999	8:00	(8,655)	13.55	286.82	5.30
08/14/1999	8:00	(7,215)	12.65	287.72	4.40
08/15/1999	8:00	(5,775)	12.01	288.36	3.76
08/16/1999	9:55	(4,220)	11.65	288.72	3.40
08/17/1999	10:10	(2,765)	10.81	289.56	2.56
08/18/1999	16:45	(930)	8.70	291.67	0.45
08/19/1999	7:00	(75)	8.25	292.12	0.00
08/20/1999	10:05	1,550	8.40	291.97	0.15
08/21/1999	11:35	3,080	8.92	291.45	0.67
08/22/1999	9:00	4,365	9.16	291.21	0.91
08/23/1999	7:40	5,725	9.30	291.07	1.05
08/24/1999	9:15	7,260	12.33	288.04	4.08
08/25/1999	12:15	8,880	13.65	286.72	5.40
08/26/1999	14:00	10,425	14.41	285.96	6.16
08/27/1999	10:15	11,640	14.90	285.47	6.65
08/28/1999	11:25	13,150	15.33	285.04	7.08

Manual Well Data

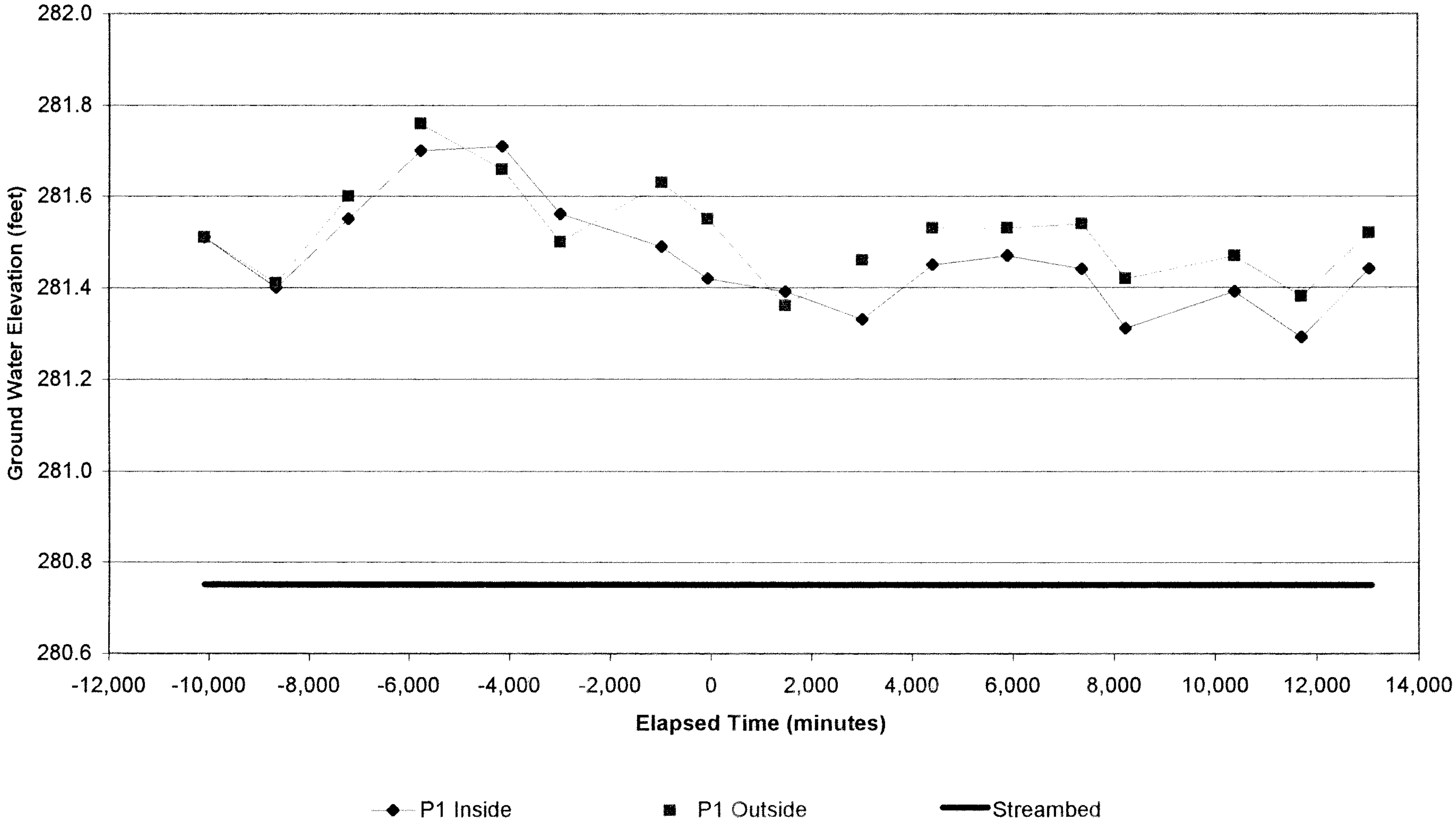
Date	Time	Elapsed Time	OW75 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)			
08/12/1999	8:00	(10,095)			
08/13/1999	8:00	(8,655)			
08/14/1999	8:00	(7,215)			
08/15/1999	8:00	(5,775)			
08/16/1999	8:00	(4,335)			
08/17/1999	6:30	(2,985)	16.93	323.61	-0.20
08/18/1999	16:00	(975)	17.04	323.50	-0.09
08/19/1999	7:15	(60)	17.13	323.41	0.00
08/20/1999	8:55	1,480	17.23	323.31	0.10
08/21/1999	10:20	3,005	17.26	323.28	0.13
08/22/1999	9:30	4,395	17.36	323.18	0.23
08/23/1999	10:15	5,880	17.46	323.08	0.33
08/24/1999	11:00	7,365	17.54	323.00	0.41
08/25/1999	1:15	8,220	17.65	322.89	0.52
08/26/1999	13:25	10,390	17.68	322.86	0.55
08/27/1999	11:15	11,700	17.80	322.74	0.67
08/28/1999	9:40	13,045	17.82	322.72	0.69

Manual Well Data

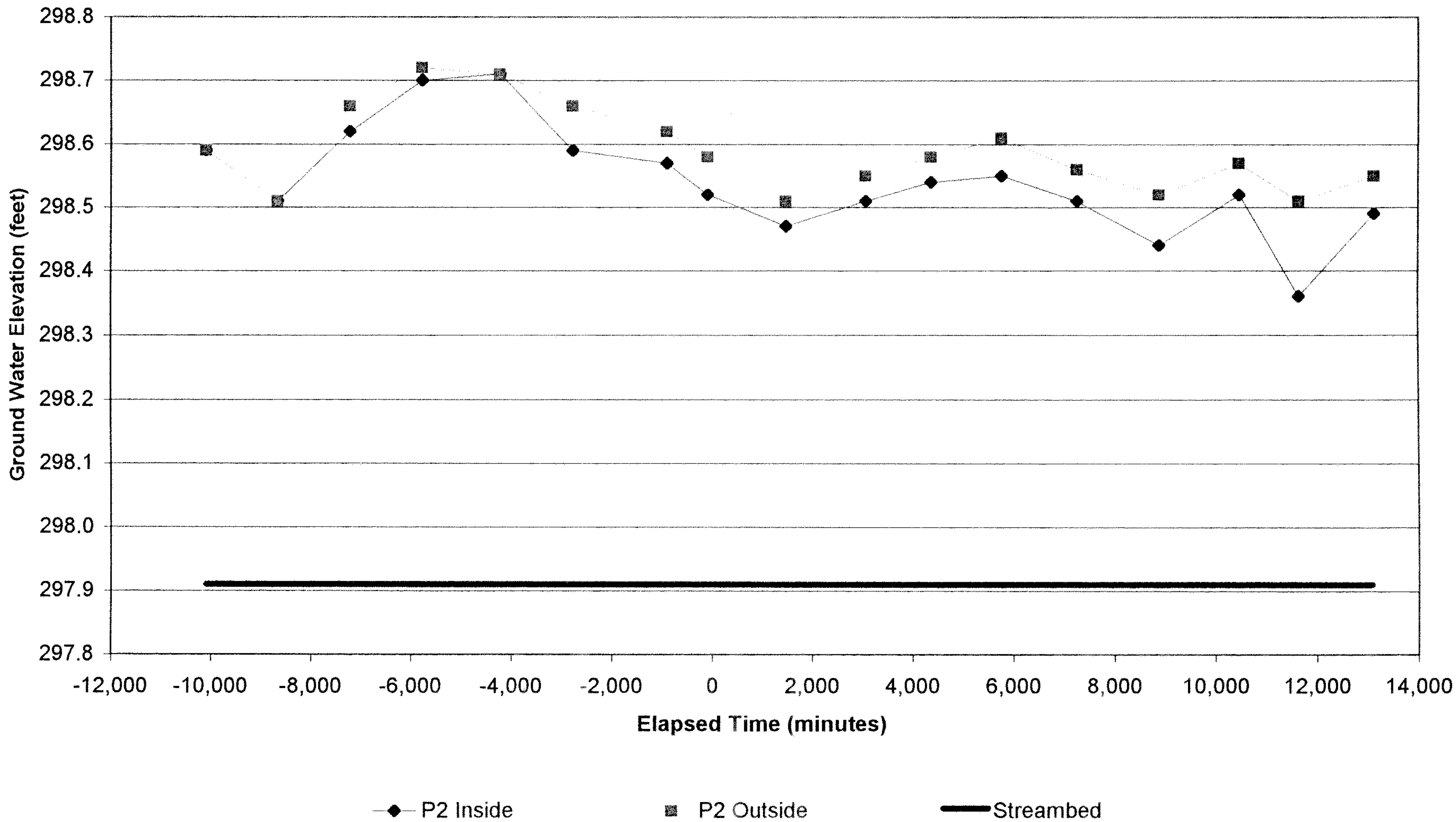
Date	Time	Elapsed Time	OW76 DTW	ELEV (ft)	DD (ft)
08/11/1999	8:00	(11,535)			
08/12/1999	8:00	(10,095)			
08/13/1999	8:00	(8,655)			
08/14/1999	8:00	(7,215)			
08/15/1999	8:00	(5,775)			
08/16/1999	8:00	(4,335)			
08/17/1999	8:00	(2,895)			
08/18/1999	7:00	(1,515)	36.34	296.38	-0.01
08/19/1999	7:00	(75)	36.35	296.37	0.00
08/20/1999	8:00	1,425	36.10	296.62	-0.25
08/21/1999	11:35	3,080	36.20	296.52	-0.15
08/22/1999	9:00	4,365	36.21	296.51	-0.14
08/23/1999	7:40	5,725	36.25	296.47	-0.10
08/24/1999	9:15	7,260	36.18	296.54	-0.17
08/25/1999	11:30	8,835	36.08	296.64	-0.27
08/26/1999	14:00	10,425	36.81	295.91	0.46
08/27/1999	9:35	11,600	36.10	296.62	-0.25
08/28/1999	11:25	13,150	36.21	296.51	-0.14

E

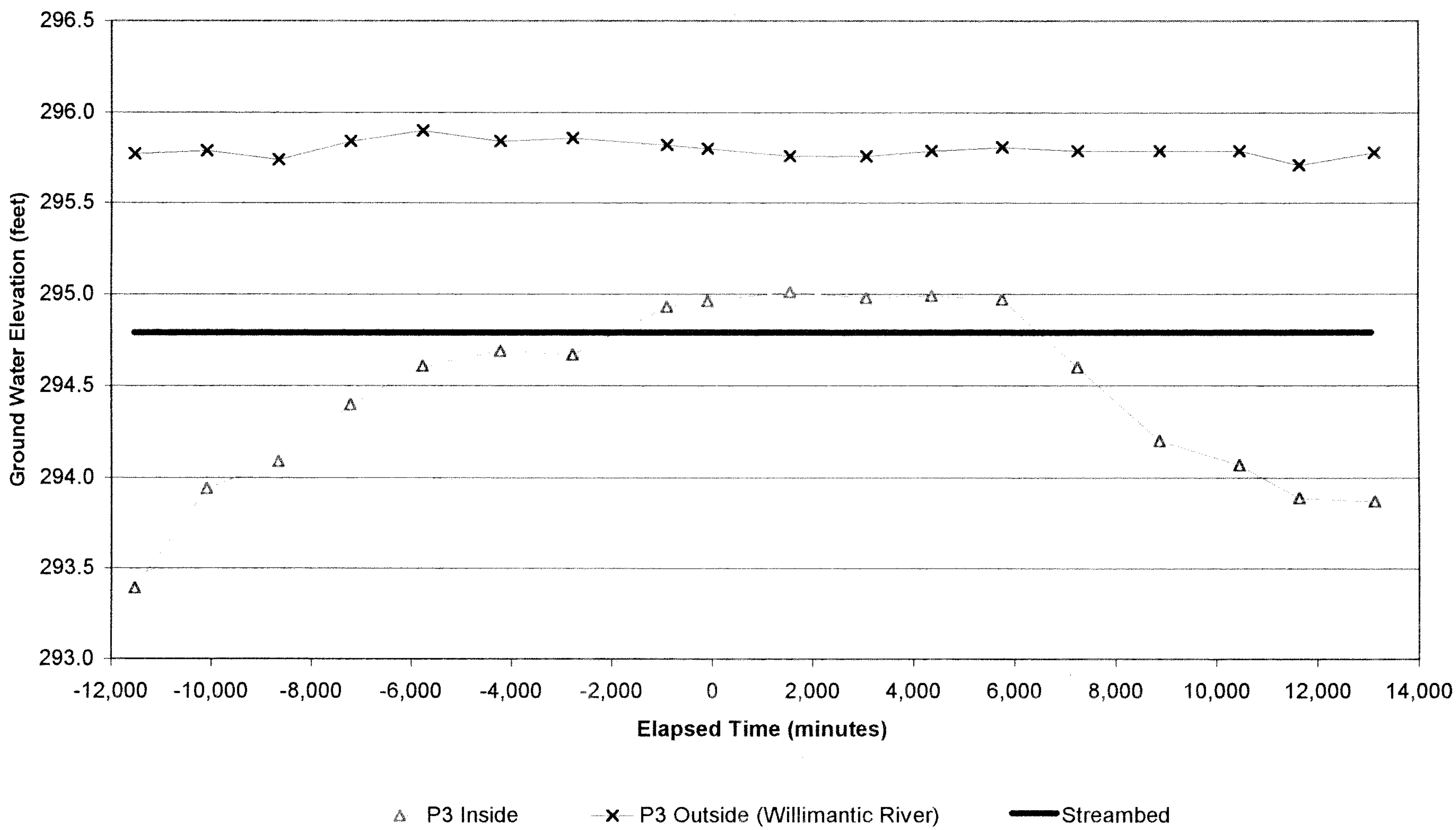
Willimantic River Piezometer Elevations

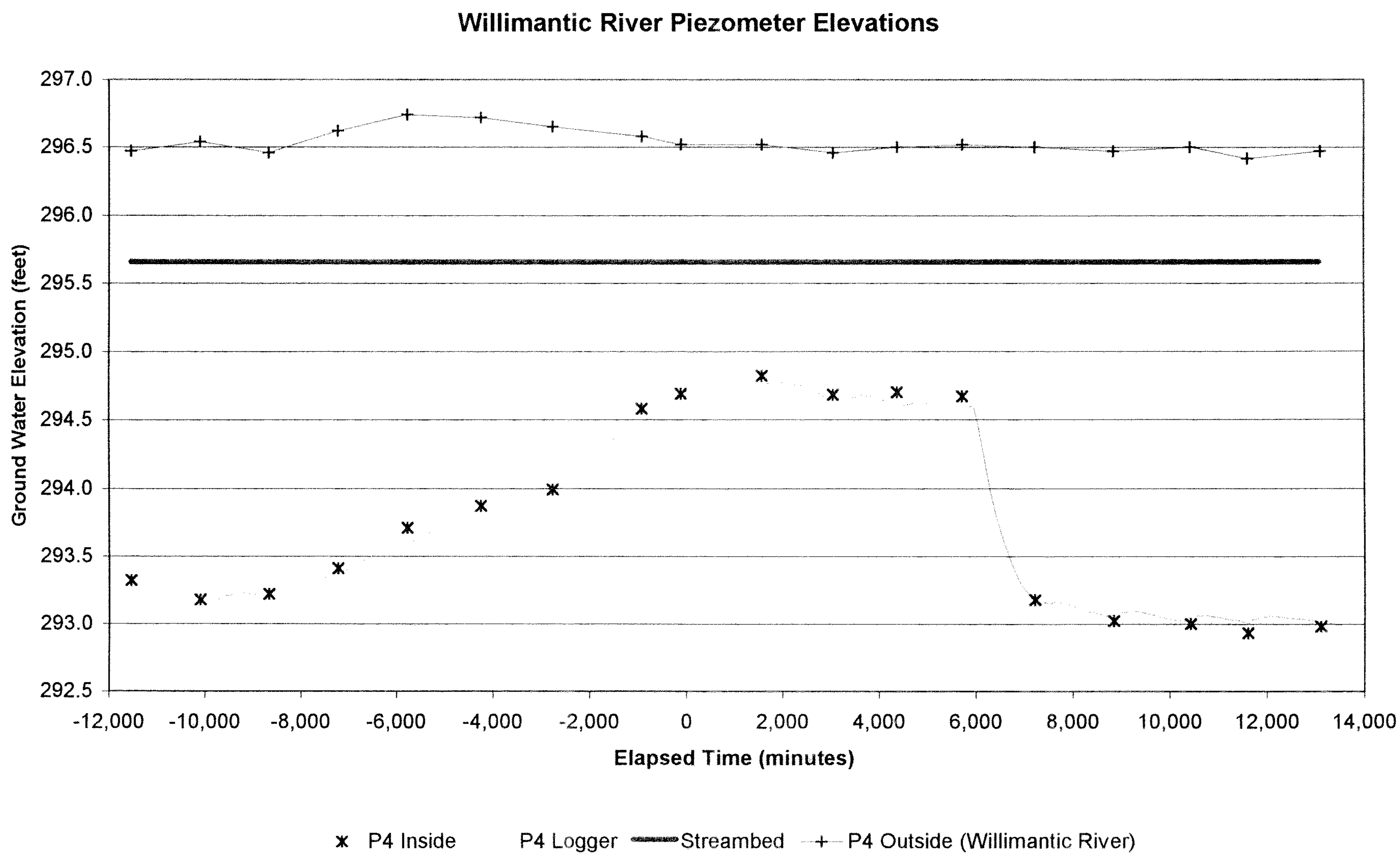


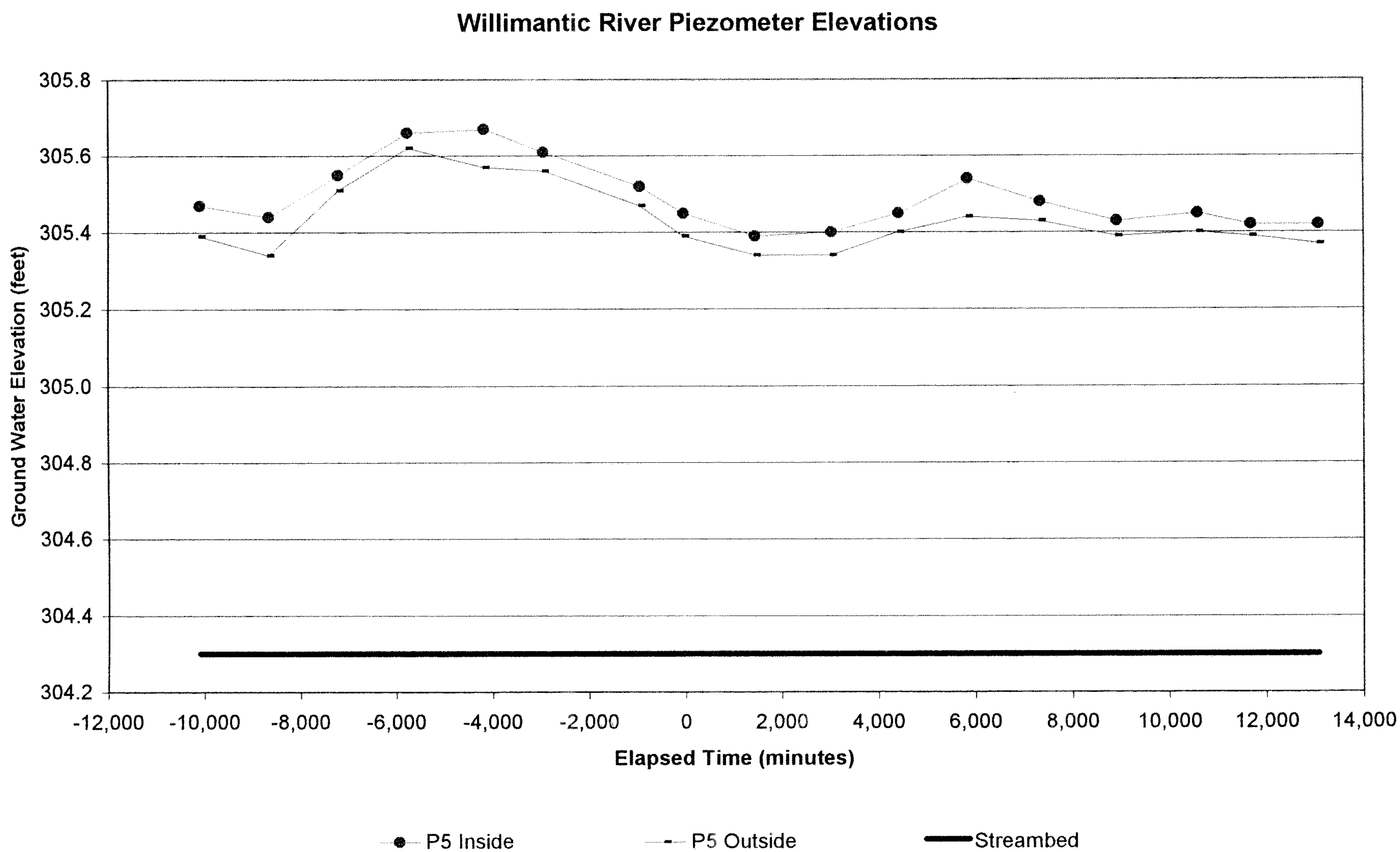
Willimantic River Piezometer Elevations



Willimantic River Piezometer Elevations




Willimantic River Piezometer Elevations
297.0
296.5
296.0
295.5
295.0
294.5
294.0
293.5
293.0
292.5
Ground Water Elevation (feet)
-12,000
-10,000
-8,000
-6,000
-4,000
-2,000
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
Elapsed Time (minutes)
P4 Inside
P4 Logger
Streambed
P4 Outside (Willimantic River)


Willimantic River Piezometer Elevations
305.8
305.6
305.4
305.2
305.0
304.8
304.6
304.4
304.2
Ground Water Elevation (feet)
-12,000
-10,000
-8,000
-6,000
-4,000
-2,000
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
Elapsed Time (minutes)
P5 Inside
P5 Outside
Streambed

F

Piezometer Data

Date	Time	Elapsed	P1		ELEV		DD		Streambed
			IN	OUT	IN	OUT	IN	OUT	Elev. (ft)
08/11/1999	8:00	(11,535)							
08/12/1999	8:00	(10,095)	2.25	2.25	281.51	281.51	0.04	0.09	280.75
08/13/1999	8:00	(8,655)	2.36	2.35	281.40	281.41	0.15	0.19	280.75
08/14/1999	8:00	(7,215)	2.21	2.16	281.55	281.60	0.00	0.00	280.75
08/15/1999	8:00	(5,775)	2.06	2.00	281.70	281.76	-0.15	-0.16	280.75
08/16/1999	11:10	(4,145)	2.05	2.10	281.71	281.66	-0.16	-0.06	280.75
08/17/1999	6:30	(2,985)	2.20	2.26	281.56	281.50	-0.01	0.10	280.75
08/18/1999	16:00	(975)	2.27	2.13	281.49	281.63	0.06	-0.03	280.75
08/19/1999	7:15	(60)	2.34	2.21	281.42	281.55	0.13	0.05	280.75
08/20/1999	8:55	1,480	2.37	2.40	281.39	281.36	0.16	0.24	280.75
08/21/1999	10:20	3,005	2.43	2.30	281.33	281.46	0.22	0.14	280.75
08/22/1999	9:30	4,395	2.31	2.23	281.45	281.53	0.10	0.07	280.75
08/23/1999	10:15	5,880	2.29	2.23	281.47	281.53	0.08	0.07	280.75
08/24/1999	11:00	7,365	2.32	2.22	281.44	281.54	0.11	0.06	280.75
08/25/1999	1:15	8,220	2.45	2.34	281.31	281.42	0.24	0.18	280.75
08/26/1999	13:25	10,390	2.37	2.29	281.39	281.47	0.16	0.13	280.75
08/27/1999	11:15	11,700	2.47	2.38	281.29	281.38	0.26	0.22	280.75
08/28/1999	9:40	13,045	2.32	2.24	281.44	281.52	0.11	0.08	280.75

Piezometer Data

Date	Time	Elapsed	P2 IN	P2 OUT	ELEV IN	ELEV OUT	DD IN	DD OUT	Streambed Elev. (ft)
08/11/1999	8:00	(11,535)							297.91
08/12/1999	8:00	(10,095)	2.57	2.57	298.59	298.59	0.03	0.07	297.91
08/13/1999	8:00	(8,655)	2.65	2.65	298.51	298.51	0.11	0.15	297.91
08/14/1999	8:00	(7,215)	2.54	2.50	298.62	298.66	0.00	0.00	297.91
08/15/1999	8:00	(5,775)	2.46	2.44	298.70	298.72	-0.08	-0.06	297.91
08/16/1999	9:50	(4,225)	2.45	2.45	298.71	298.71	-0.09	-0.05	297.91
08/17/1999	9:58	(2,777)	2.57	2.50	298.59	298.66	0.03	0.00	297.91
08/18/1999	17:10	(905)	2.59	2.54	298.57	298.62	0.05	0.04	297.91
08/19/1999	6:45	(90)	2.64	2.58	298.52	298.58	0.10	0.08	297.91
08/20/1999	8:45	1,470	2.69	2.65	298.47	298.51	0.15	0.15	297.91
08/21/1999	11:20	3,065	2.65	2.61	298.51	298.55	0.11	0.11	297.91
08/22/1999	8:50	4,355	2.62	2.58	298.54	298.58	0.08	0.08	297.91
08/23/1999	8:10	5,755	2.61	2.55	298.55	298.61	0.07	0.05	297.91
08/24/1999	9:10	7,255	2.65	2.60	298.51	298.56	0.11	0.10	297.91
08/25/1999	12:10	8,875	2.72	2.64	298.44	298.52	0.18	0.14	297.91
08/26/1999	14:30	10,455	2.64	2.59	298.52	298.57	0.10	0.09	297.91
08/27/1999	10:10	11,635	2.80	2.65	298.36	298.51	0.26	0.15	297.91
08/28/1999	11:05	13,130	2.67	2.61	298.49	298.55	0.13	0.11	297.91

Piezometer Data

Date	Time	Elapsed	P3		ELEV		DD		Streambed
			IN	OUT	IN	OUT	IN	OUT	Elev. (ft)
08/11/1999	8:00	(11,535)	4.95	2.57	293.39	295.77	1.01	0.07	294.79
08/12/1999	8:00	(10,095)	4.40	2.55	293.94	295.79	0.46	0.05	294.79
08/13/1999	8:00	(8,655)	4.25	2.60	294.09	295.74	0.31	0.10	294.79
08/14/1999	8:00	(7,215)	3.94	2.50	294.40	295.84	0.00	0.00	294.79
08/15/1999	8:00	(5,775)	3.73	2.44	294.61	295.90	-0.21	-0.06	294.79
08/16/1999	9:50	(4,225)	3.65	2.50	294.69	295.84	-0.29	0.00	294.79
08/17/1999	9:58	(2,777)	3.67	2.48	294.67	295.86	-0.27	-0.02	294.79
08/18/1999	17:10	(905)	3.41	2.52	294.93	295.82	-0.53	0.02	294.79
08/19/1999	6:45	(90)	3.38	2.54	294.96	295.80	-0.56	0.04	294.79
08/20/1999	9:55	1,540	3.33	2.58	295.01	295.76	-0.61	0.08	294.79
08/21/1999	11:20	3,065	3.36	2.58	294.98	295.76	-0.58	0.08	294.79
08/22/1999	8:50	4,355	3.35	2.55	294.99	295.79	-0.59	0.05	294.79
08/23/1999	8:10	5,755	3.37	2.53	294.97	295.81	-0.57	0.03	294.79
08/24/1999	9:10	7,255	3.74	2.55	294.60	295.79	-0.20	0.05	294.79
08/25/1999	12:10	8,875	4.14	2.55	294.20	295.79	0.20	0.05	294.79
08/26/1999	14:30	10,455	4.27	2.55	294.07	295.79	0.33	0.05	294.79
08/27/1999	10:10	11,635	4.45	2.63	293.89	295.71	0.51	0.13	294.79
08/28/1999	11:05	13,130	4.47	2.56	293.87	295.78	0.53	0.06	294.79

Piezometer Data

Date	Time	Elapsed	P4		ELEV		DD		Streambed
			IN	OUT	IN	OUT	IN	OUT	Elev. (ft)
08/11/1999	8:00	(11,535)	5.65	2.50	293.32	296.47	0.09	0.15	295.66
08/12/1999	8:00	(10,095)	5.79	2.43	293.18	296.54	0.23	0.08	295.66
08/13/1999	8:00	(8,655)	5.75	2.51	293.22	296.46	0.19	0.16	295.66
08/14/1999	8:00	(7,215)	5.56	2.35	293.41	296.62	0.00	0.00	295.66
08/15/1999	8:00	(5,775)	5.26	2.23	293.71	296.74	-0.30	-0.12	295.66
08/16/1999	9:35	(4,240)	5.10	2.25	293.87	296.72	-0.46	-0.10	295.66
08/17/1999	10:15	(2,760)	4.98	2.32	293.99	296.65	-0.58	-0.03	295.66
08/18/1999	17:00	(915)	4.39	2.39	294.58	296.58	-1.17	0.04	295.66
08/19/1999	6:35	(100)	4.28	2.45	294.69	296.52	-1.28	0.10	295.66
08/20/1999	10:30	1,575	4.15	2.45	294.82	296.52	-1.41	0.10	295.66
08/21/1999	11:05	3,050	4.29	2.51	294.68	296.46	-1.27	0.16	295.66
08/22/1999	9:10	4,375	4.27	2.47	294.70	296.50	-1.29	0.12	295.66
08/23/1999	7:40	5,725	4.30	2.45	294.67	296.52	-1.26	0.10	295.66
08/24/1999	8:40	7,225	5.79	2.47	293.18	296.50	0.23	0.12	295.66
08/25/1999	11:43	8,848	5.95	2.50	293.02	296.47	0.39	0.15	295.66
08/26/1999	14:05	10,430	5.97	2.47	293.00	296.50	0.41	0.12	295.66
08/27/1999	9:45	11,610	6.04	2.55	292.93	296.42	0.48	0.20	295.66
08/28/1999	10:40	13,105	5.99	2.50	292.98	296.47	0.43	0.15	295.66

Piezometer Data

Date	Time	Elapsed	P5		ELEV		DD		Streambed
			IN	OUT	IN	OUT	IN	OUT	Elev. (ft)
08/11/1999	8:00	(11,535)							304.30
08/12/1999	8:00	(10,095)	2.87	2.95	305.47	305.39	0.08	0.12	304.30
08/13/1999	8:00	(8,655)	2.90	3.00	305.44	305.34	0.11	0.17	304.30
08/14/1999	8:00	(7,215)	2.79	2.83	305.55	305.51	0.00	0.00	304.30
08/15/1999	8:00	(5,775)	2.68	2.72	305.66	305.62	-0.11	-0.11	304.30
08/16/1999	10:40	(4,175)	2.67	2.77	305.67	305.57	-0.12	-0.06	304.30
08/17/1999	7:10	(2,945)	2.73	2.78	305.61	305.56	-0.06	-0.05	304.30
08/18/1999	16:35	(940)	2.82	2.87	305.52	305.47	0.03	0.04	304.30
08/19/1999	7:40	(35)	2.89	2.95	305.45	305.39	0.10	0.12	304.30
08/20/1999	8:20	1,445	2.95	3.00	305.39	305.34	0.16	0.17	304.30
08/21/1999	10:45	3,030	2.94	3.00	305.40	305.34	0.15	0.17	304.30
08/22/1999	9:50	4,415	2.89	2.94	305.45	305.40	0.10	0.11	304.30
08/23/1999	9:35	5,840	2.80	2.90	305.54	305.44	0.01	0.07	304.30
08/24/1999	10:30	7,335	2.86	2.91	305.48	305.43	0.07	0.08	304.30
08/25/1999	12:50	8,915	2.91	2.95	305.43	305.39	0.12	0.12	304.30
08/26/1999	16:45	10,590	2.89	2.94	305.45	305.40	0.10	0.11	304.30
08/27/1999	10:55	11,680	2.92	2.95	305.42	305.39	0.13	0.12	304.30
08/28/1999	10:10	13,075	2.92	2.97	305.42	305.37	0.13	0.14	304.30

G

PRECIPITATION DATA

Date	Elapsed Time Begin	Elapsed Time End	Precipitation (inches)
08/14/1999	(7,620)	(6,180)	0.75
08/15/1999	(6,180)	(4,740)	0.40
08/16/1999	(4,740)	(3,300)	0.00
08/17/1999	(3,300)	(1,860)	0.00
08/18/1999	(1,860)	(420)	0.00
08/19/1999	(420)	1,020	0.00
08/20/1999	1,020	2,460	0.00
08/21/1999	2,460	3,900	0.17
08/22/1999	3,900	5,340	0.05
08/23/1999	5,340	6,780	0.00
08/24/1999	6,780	8,220	0.00
08/25/1999	8,220	9,660	0.00
08/26/1999	9,660	11,100	0.04
08/27/1999	11,100	12,540	0.10
08/28/1999	12,540	13,980	0.00

H

Date	Well Field G1		Merrow Road G2		Rte. 44 G3	
	Gage Height	Flow (cfs)	Gage Height	Flow (cfs)	Gage Height	Flow (cfs)
8/13/1999	1.02	8.88	0.65	8.22	0.72	7.32
8/27/1999	0.97	4.65	0.60	7.40	0.66	4.22

DISCHARGE MEASUREMENT SHEET

LOCATION: Willimantic River - near pump house **JOB: 99-513** **DATE: 8/13/99**

GAGE # 1 **GAGE HEIGHT: 1.02** **WEATHER: sunny 80's** **OBSERVER: EP**

Dist. From Int. Pt.	Width (ft)	Depth (ft)	Rev.	Time (sec.)	Velocity (fps)	Area (sq. ft.)	Discharge (cfs)
2.0	0.50	0.10			0.00	0.05	0.000
3.0	1.00	0.10			0.00	0.10	0.000
4.0	1.00	0.30			0.60	0.30	0.180
5.0	1.00	0.30			0.90	0.30	0.270
6.0	1.00	0.30			0.80	0.30	0.240
7.0	1.00	0.40			1.50	0.40	0.600
8.0	1.00	0.50			1.30	0.50	0.650
9.0	1.00	0.50			1.90	0.50	0.950
10.0	1.00	0.55			2.60	0.55	1.430
11.0	1.00	0.50			2.50	0.50	1.250
12.0	1.00	0.40			1.50	0.40	0.600
13.0	1.00	0.30			0.90	0.30	0.270
14.0	1.00	0.20			0.20	0.20	0.040
15.0	0.50	0.00			0.00	0.00	0.000
2.0	0.50	0.20			0.00	0.10	0.000
3.0	1.00	0.30			0.10	0.30	0.030
4.0	1.00	0.40			0.30	0.40	0.120
5.0	1.00	0.50			0.80	0.50	0.400
6.0	1.00	0.60			0.60	0.60	0.360
7.0	1.00	0.40			0.00	0.40	0.000
8.0	1.00	0.40			0.00	0.40	0.000
9.0	1.00	0.40			0.80	0.40	0.320
10.0	1.00	0.40			0.30	0.40	0.120
11.0	1.00	0.30			0.70	0.30	0.210
12.0	1.00	0.30			0.80	0.30	0.240
13.0	1.00	0.30			0.70	0.30	0.210
14.0	1.00	0.20			0.80	0.20	0.160
15.0	1.00	0.20			0.70	0.20	0.140
16.0	1.00	0.15			0.60	0.15	0.090
17.0	0.50	0.10			0.00	0.05	0.000
						TOTAL =	**8.88**

DISCHARGE MEASUREMENT SHEET

LOCATION: Willimantic River - near park **JOB: 99-513** **DATE: 8/13/99**

GAGE # 2 **GAGE HEIGHT: 0.65** **WEATHER: sunny 80's** **OBSERVER: EP**

Dist. From Int. Pt.	Width (ft)	Depth (ft)	Rev.	Time (sec.)	Velocity (fps)	Area (sq. ft.)	Discharge (cfs)
3.0	0.50	0.00			0.00	0.00	0.000
4.0	1.00	0.30			0.10	0.30	0.030
5.0	1.00	0.50			0.40	0.50	0.200
6.0	1.00	0.55			0.40	0.55	0.220
7.0	1.00	0.60			0.70	0.60	0.420
8.0	1.00	0.70			0.40	0.70	0.280
9.0	1.00	0.75			0.90	0.75	0.675
10.0	1.00	0.75			0.80	0.75	0.600
11.0	1.00	0.75			0.80	0.75	0.600
12.0	1.00	0.75			0.70	0.75	0.525
13.0	1.00	0.80			0.70	0.80	0.560
14.0	1.00	0.80			0.80	0.80	0.640
15.0	1.00	0.80			0.90	0.80	0.720
16.0	1.00	0.80			0.80	0.80	0.640
17.0	1.00	0.80			0.60	0.80	0.480
18.0	1.00	0.75			0.90	0.75	0.675
19.0	1.00	0.75			0.60	0.75	0.450
20.0	1.00	0.70			0.30	0.70	0.210
21.0	1.00	0.60			0.40	0.60	0.240
22.0	1.00	0.50			0.10	0.50	0.050
23.0	0.50	0.30			0.00	0.15	0.000
						TOTAL =	**8.22**

DISCHARGE MEASUREMENT SHEET

LOCATION: Willimantic River - under bridge **JOB: 99-513** **DATE: 8/13/99**

GAGE # 3 **GAGE HEIGHT: 0.72** **WEATHER: sunny 80's** **OBSERVER: EP**

Dist. From Int. Pt.	Width (ft)	Depth (ft)	Rev.	Time (sec.)	Velocity (fps)	Area (sq. ft.)	Discharge (cfs)
6.0	0.50	0.00			0.00	0.00	0.000
7.0	1.00	0.30			0.00	0.30	0.000
8.0	1.00	0.50			0.10	0.50	0.050
9.0	1.00	0.80			0.10	0.80	0.080
10.0	1.00	1.10			0.10	1.10	0.110
11.0	1.00	1.20			0.10	1.20	0.120
12.0	1.00	1.30			0.40	1.30	0.520
13.0	1.00	1.30			0.70	1.30	0.910
14.0	1.00	1.40			0.60	1.40	0.840
15.0	1.00	1.40			0.60	1.40	0.840
16.0	1.00	1.40			0.60	1.40	0.840
17.0	1.00	1.50			0.40	1.50	0.600
18.0	1.00	1.40			0.20	1.40	0.280
19.0	1.00	1.40			0.20	1.40	0.280
20.0	1.00	1.10			0.20	1.10	0.220
21.0	1.00	0.65			0.30	0.65	0.195
22.0	1.00	1.00			0.60	1.00	0.600
23.0	1.00	0.90			0.30	0.90	0.270
24.0	1.00	0.70			0.40	0.70	0.280
25.0	1.00	0.60			0.30	0.60	0.180
26.0	1.00	0.40			0.10	0.40	0.040
27.0	1.00	0.40			0.10	0.40	0.040
28.0	0.50	0.40			0.10	0.20	0.020
						TOTAL =	**7.32**

University of Connecticut
Willimantic River Wellfield

Stream Gauging

DISCHARGE MEASUREMENT SHEET

LOCATION: Willimantic River - Well Field **JOB: 99-513** **DATE: 8/27/99**

GAGE # 1 **GAGE HEIGHT: 0.97** **WEATHER: rainy 80's** **OBSERVER: EP/CY**

Dist. From Int. Pt.	Width (ft)	Depth (ft)	Rev.	Time (sec.)	Velocity (fps)	Area (sq. ft.)	Discharge (cfs)
7.0	0.50	0.20			0.10	0.10	0.010
8.0	1.00	0.20			0.40	0.20	0.080
9.0	1.00	0.30			0.30	0.30	0.090
10.0	1.00	0.40			1.00	0.40	0.400
11.0	1.00	0.50			1.40	0.50	0.700
12.0	1.00	0.50			1.00	0.50	0.500
13.0	1.00	0.50			1.30	0.50	0.650
14.0	1.00	0.40			2.00	0.40	0.800
15.0	1.00	0.30			1.00	0.30	0.300
16.0	0.50	0.20			0.30	0.10	0.030
6.0	0.50	0.10			0.10	0.05	0.005
7.0	1.00	0.50			0.30	0.50	0.150
8.0	1.00	0.50			0.60	0.50	0.300
9.0	1.00	0.45			0.40	0.45	0.180
10.0	1.00	0.40			0.60	0.40	0.240
11.0	1.00	0.30			0.40	0.30	0.120
12.0	1.00	0.40			0.10	0.40	0.040
13.0	1.00	0.40			0.10	0.40	0.040
14.0	0.50	0.30			0.10	0.15	0.015
						TOTAL =	**4.65**

University of Connecticut
Willimantic River Wellfield

Stream Gauging

DISCHARGE MEASUREMENT SHEET

LOCATION: Willimantic River - Merrow Road **JOB: 99-513** **DATE: 8/27/99**

GAGE # 2 **GAGE HEIGHT: 0.60** **WEATHER: rainy 80's** **OBSERVER: EP/CY**

Dist. From Int. Pt.	Width (ft)	Depth (ft)	Rev.	Time (sec.)	Velocity (fps)	Area (sq. ft.)	Discharge (cfs)
7.0	0.50	0.20			0.10	0.10	0.010
8.0	1.00	0.50			0.10	0.50	0.050
9.0	1.00	0.60			0.10	0.60	0.060
10.0	1.00	0.70			0.40	0.70	0.280
11.0	1.00	0.70			0.30	0.70	0.210
12.0	1.00	0.80			0.60	0.80	0.480
13.0	1.00	0.80			0.80	0.80	0.640
14.0	1.00	0.80			0.70	0.80	0.560
15.0	1.00	0.90			0.40	0.90	0.360
16.0	1.00	0.90			0.60	0.90	0.540
17.0	1.00	0.80			0.70	0.80	0.560
18.0	1.00	0.80			0.90	0.80	0.720
19.0	1.00	0.80			0.80	0.80	0.640
20.0	1.00	0.75			0.70	0.75	0.525
21.0	1.00	0.80			0.90	0.80	0.720
22.0	1.00	0.70			0.40	0.70	0.280
23.0	1.00	0.60			0.60	0.60	0.360
24.0	1.00	0.60			0.40	0.60	0.240
25.0	1.00	0.40			0.30	0.40	0.120
26.0	1.00	0.30			0.10	0.30	0.030
27.0	0.50	0.20			0.10	0.10	0.010
						TOTAL =	**7.40**

DISCHARGE MEASUREMENT SHEET

LOCATION: Willimantic River - Rte. 44 **JOB: 99-513** **DATE: 8/27/99**

GAGE # 3 **GAGE HEIGHT: 0.66** **WEATHER: rainy 80's** **OBSERVER: EP/CY**

Dist. From Int. Pt.	Width (ft)	Depth (ft)	Rev.	Time (sec.)	Velocity (fps)	Area (sq. ft.)	Discharge (cfs)
11.0	0.50	0.40			0.10	0.20	0.020
12.0	1.00	0.35			0.00	0.35	0.000
13.0	1.00	1.00			0.10	1.00	0.100
14.0	1.00	1.20			0.10	1.20	0.120
15.0	1.00	1.20			0.30	1.20	0.360
16.0	1.00	1.30			0.60	1.30	0.780
17.0	1.00	1.40			0.20	1.40	0.280
18.0	1.00	1.40			0.40	1.40	0.560
19.0	1.00	1.30			0.30	1.30	0.390
20.0	1.00	1.40			0.20	1.40	0.280
21.0	1.00	1.40			0.20	1.40	0.280
22.0	1.00	1.30			0.10	1.30	0.130
23.0	1.00	1.00			0.10	1.00	0.100
24.0	1.00	0.60			0.10	0.60	0.060
25.0	1.00	1.00			0.30	1.00	0.300
26.0	1.00	0.90			0.20	0.90	0.180
27.0	1.00	0.70			0.30	0.70	0.210
28.0	1.00	0.50			0.10	0.50	0.050
29.0	0.50	0.30			0.10	0.15	0.015
						TOTAL =	**4.22**

I

J

CPR-9 Rev. 7/95

STATE OF CONNECTICUT
DEPARTMENT OF CONSUMER PROTECTION
REAL ESTATE & PROFESSIONAL TRADES DIVISION
WELL DRILLING COMPLETION REPORT
165 Capitol Avenue, Hartford, Connecticut 06106

Do NOT fill in
STATE WELL NO.
OTHER NO.

OWNER	NAME: University of Connecticut	ADDRESS: 31 DeLoyt Rd U-58 Stoors Ct
LOCATION OF WELL	(No. & Street) (Town) (Lot Number): Rt 32 Mansfield Ct Wellfield	

PROPOSED USE OF WELL: ☐ DOMESTIC ☐ BUSINESS ESTABLISHMENT ☐ FARM ☐ TEST WELL ☑ PUBLIC SUPPLY ☐ INDUSTRIAL ☐ AIR CONDITIONING ☐ OTHER (Specify)

DRILLING EQUIPMENT: ☐ ROTARY ☐ COMPRESSED AIR PERCUSSION ☑ CABLE PERCUSSION ☐ OTHER (Specify)

CASING DETAILS:

LENGTH (feet)	DIAMETER (inches)	WEIGHT PER FOOT	THREADED / WELDED	DRIVE SHOE	WAS CASING GROUTED?
38	12	50	☐ THREADED ☑ WELDED	☐ YES ☑ NO	☑ YES ☐ NO

YIELD TEST: ☐ BAILED ☑ PUMPED ☐ COMPRESSED AIR — HOURS: 4 — YIELD (GPM): 500

WATER LEVEL:

MEASURE FROM LAND SURFACE - STATIC (Specify feet)	DURING YIELD TEST (feet)	Depth of Completed Well in feet
12	41	63

SCREEN DETAILS:

MAKE					LENGTH OPEN TO AQUIFER (feet)	
Johnson					15	
SLOT SIZE	DIAMETER (inches)	IF GRAVEL PACKED:	Diameter of well including gravel pack (inches)	GRAVEL SIZE (inches)	FROM (feet)	TO (feet)
.080	12		20"		63	26

DEPTH FROM LAND TO SURFACE FEET TO FEET		FORMATION DESCRIPTION
0	13	Fill Loam + Sand
13	28	Med Course Sand
		Some Gravel
28	33	Course Sand
33	38	Cobbles Gravel
38	53	Gravel Course Sand
		Some Cobbles
53	71	Fine Sand
		Some Coarse Sand
71	—	Bedrock

Sketch exact location of well with distances, to at least two permanent landmarks

old Pump house #4

7'

6'

If yield was tested at different depths during drilling, list below

FEET	GALLONS PER MINUTE

DATE WELL COMPLETED	PERMIT NO.	REGISTRATION NO.	DATE OF REPORT	WELL DRILLER (Signature)
12-28-98	190026	13	1-28-99	[signature]

AGENCY

CPR-8 Rev. 7/95

PERMIT NUMBER
190026

STATE OF CONNECTICUT
DEPARTMENT OF CONSUMER PROTECTION
REAL ESTATE & PROFESSIONAL TRADES DIVISION

WELL DRILLING PERMIT

165 Capitol Avenue, Hartford, Connecticut 06106

LOCATION OF WELL (Town) MANSFIELD (Street) OFF RT 32 (Lot Number)

DATE 9-15-98

OWNER OF WELL Associated Water Svc

☐ INDIVIDUAL ☐ BUILDER ☑ OTHER (Specify) Water Company

OWNER'S ADDRESS Buckley Highway Stafford Springs CT (U-CONN WELL FILED)

PROPOSED USE OF WELL

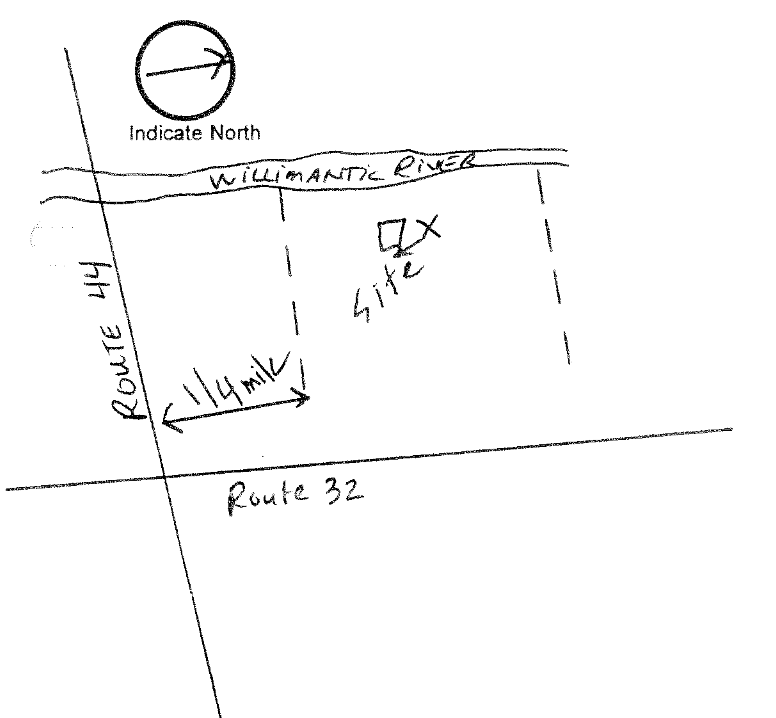
☐ DOMESTIC ☐ BUSINESS ESTABLISHMENT ☐ FARM ☐ TEST WELL
☑ PUBLIC SUPPLY ☐ INDUSTRIAL ☐ AIR CONDITIONING ☐ OTHER (Specify)

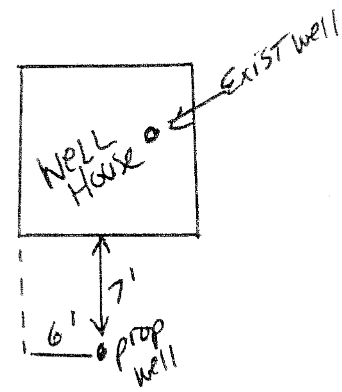
Est. No. of People being served. Public Supply

SKETCH OF WELL LOCATION

Locate well with respect to at least two roads, showing distance from intersection and front of lot

location of lot to at least two roads	Well location on to and to house (if present)





See ATTACHED WELLSITE approval

Approximate number of feet from well to nearest source of possible contamination: 280' to Willi -RIVER -

The undersigned is aware that upon completion of the well, a "Well Completion Report" containing construction details and information required under Section 25-131 of the 1969 Supplement to the General Statutes must be sent to the owner, the Department of Consumer Protection and the Water Resources Commission on the form provided by the agency. This permit is ~~not~~ valid until all information is filled in and it has been counter-signed by the Director of Health or his agent. LAFRAMBOISE WELL DRILLING

APPLICANT (Signature) [signature]

APPLICANT'S ADDRESS P.O. Box 303 Thompson CT 06277

REGISTRATION NO. 13

☒ APPROVED ☐ REJECTED

BY (Town Health Officer or Agent) [signature]

DATE 9/24/98

REMARKS
Site has been approved by DPH water supply section

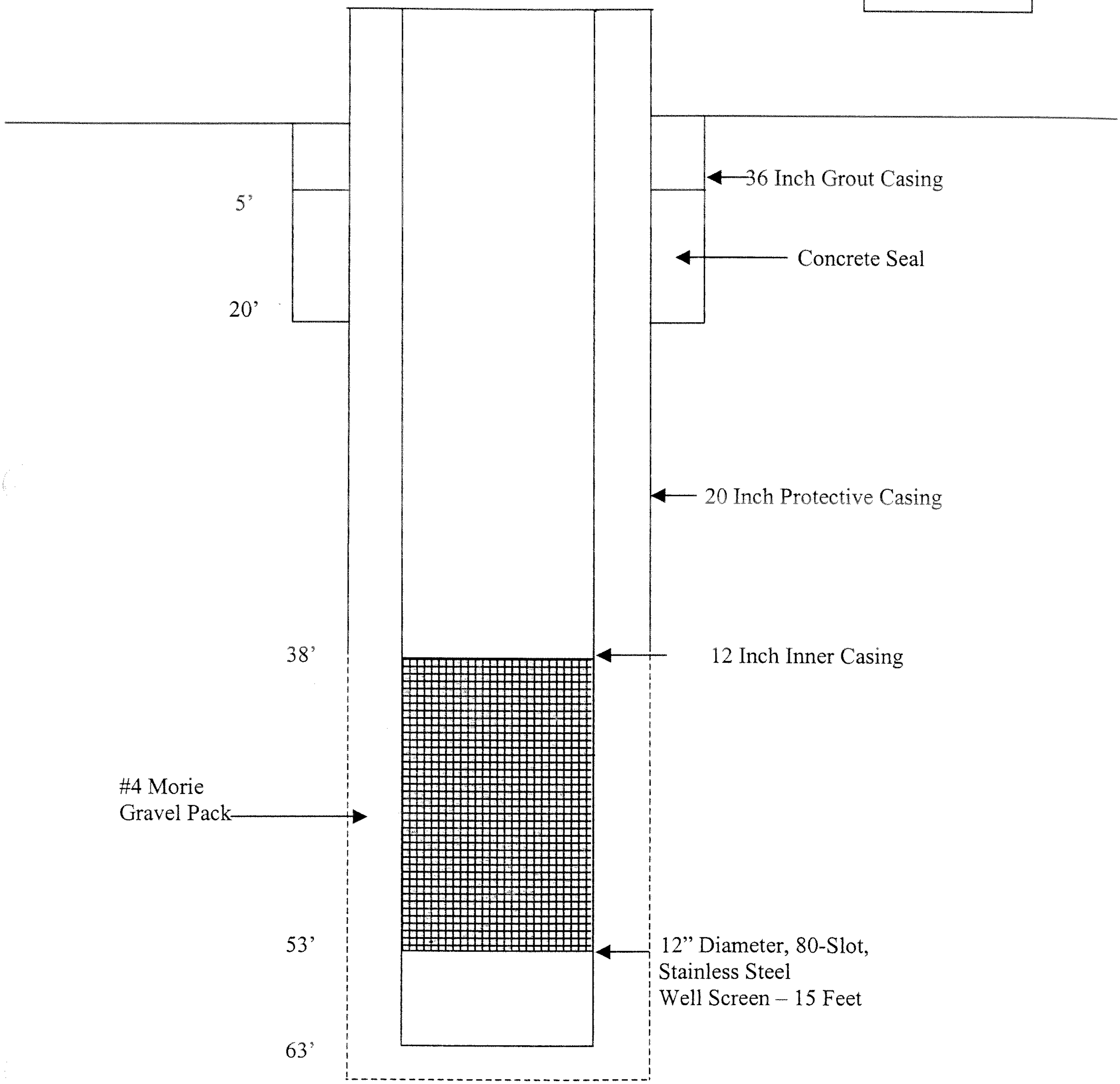
Rec'd 35.00 9/24/98 CK# 4007

RECEIVED
SEP 17 1998
EHHD

K

12 Inch x 20 Inch Gravel Packed Well As-Built

NOT TO SCALE



L

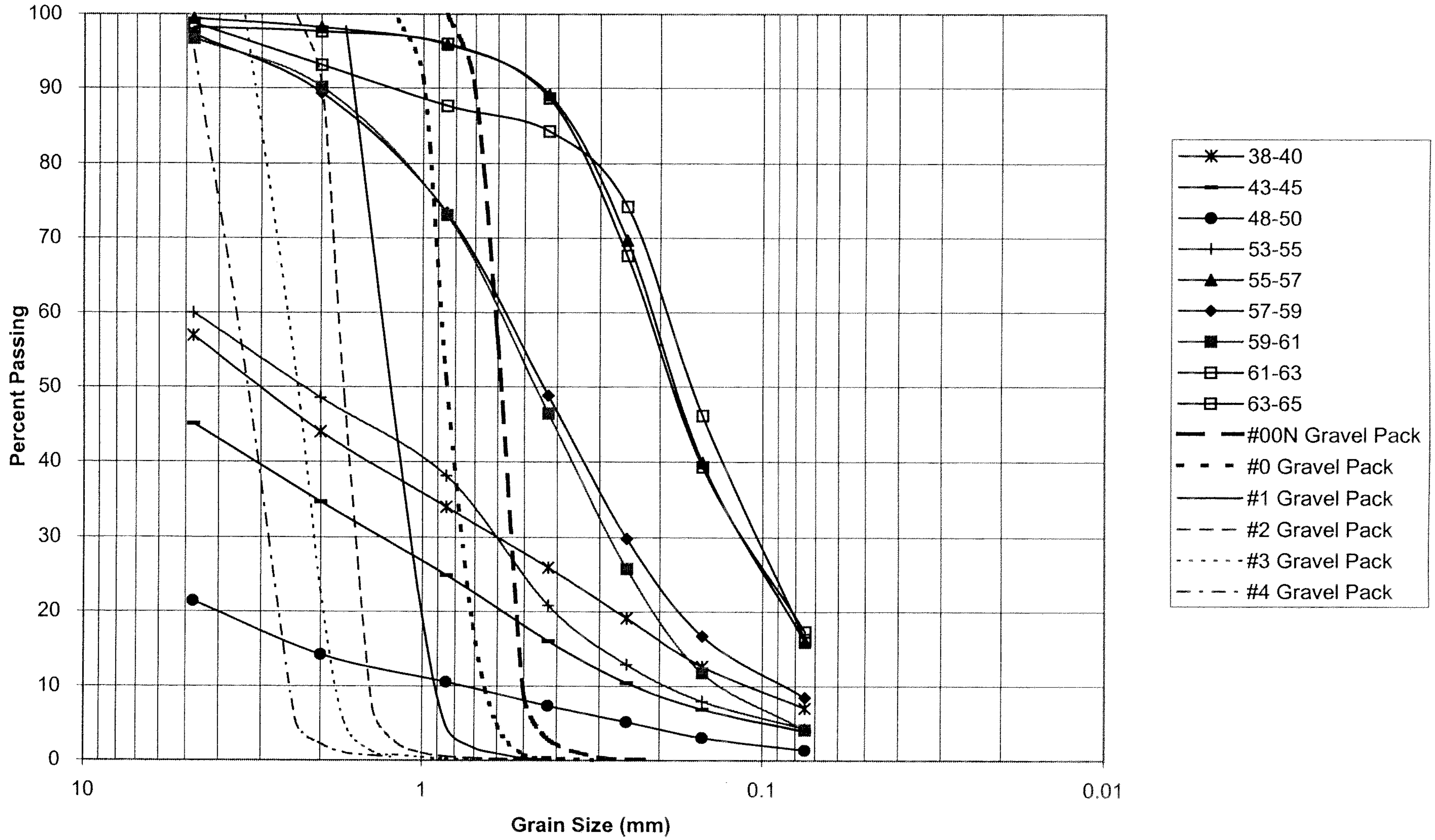
UCONN Well #4 Design Summary

Aquifer Depth	71 ft.
Depth to Water	14 ft.
Well Type	Gravel-packed
Screen Length	15 ft.
Top of Screen	38 ft.
Bottom of Screen	53 ft.
Available drawdown	19 ft. max.
Minimum required specific capacity	26.3 gpm/ft
Design Yield	500 gpm
Maximum Screen Entrance Velocity	0.1 fps
Required Screen Transmitting Capacity (50% Efficiency)	66.67 gpm/ft
Required Screen Opening Area	215.1 sq.in./ft.
Temporary Outer Casing Diameter	20 inches
Well Casing Diameter	12 inches
Screen and Riser Pipe Diameter	12 inches
70 % size of limiting soil layer	0.6 mm
Multiplier	6
Gravel Pack Target Point	3.6 mm
Gravel Pack	#4 Well Gravel
90% Size of GP	0.094 inches

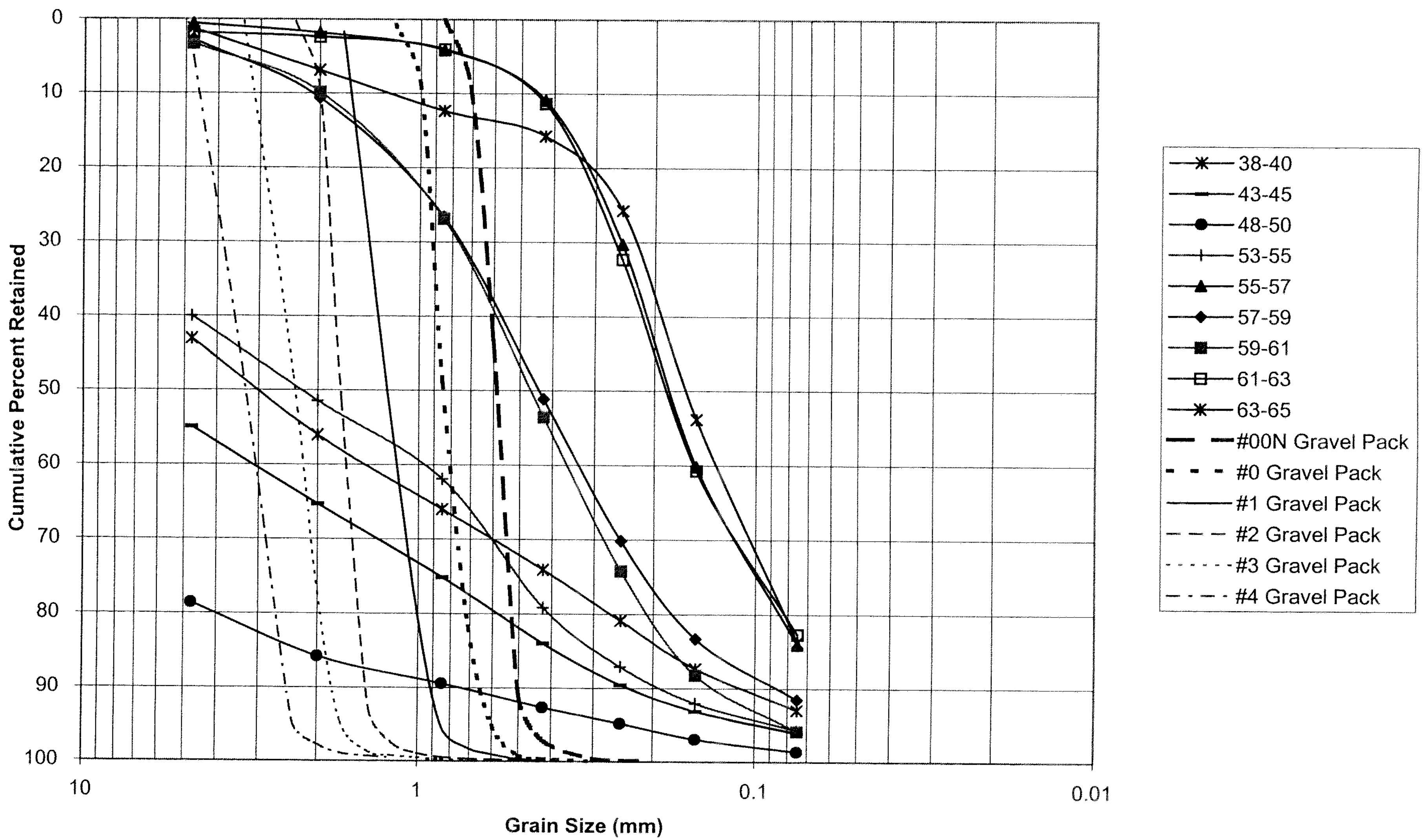
Stainless Steel, High	
Flow Screen Slot Size	80 Slot
Screen Area	254 sq.in./ft.
Specific Yield	78.74 gpm/ft
Theoretical yield	1181.1 gpm
Required well efficiency	
at design flow	42%
Screen Entrance Velocity	
@ Design Flow	0.042

M

UCONN Well #4 Design - Grain Size Distribution



UCONN Well #4 Design - Grain Size Distribution



SIEVE ANALYSIS AND WELL DESIGN, Cumulative Percent Retained

11/23/1999

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	43'-45'	
Purpose:	Well Design	
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	CT	Date: 9-22-98

Wt of dry sample + container	221.0
Wt of container	17.9
Wt of dry sample	203.1

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	110.0	54.9	45.1
#10	**2**	20.8	65.3	34.7
#20	**0.85**	19.6	75.1	24.9
#40	**0.425**	17.7	83.9	16.1
#60	**0.25**	11.2	89.5	10.5
#100	**0.15**	7.2	93.1	6.9
#200	**0.075**	6.0	96.1	3.9
PAN	**-**	7.8	100.0	0.0
Total:		200.3		

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	38'-40'	
Purpose:	Well Design	
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	JT	Date: 9-22-98

Wt of dry sample + container	428.3
Wt of container	17.9
Wt of dry sample	410.4

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	176.5	43.1	56.9
#10	**2**	53.0	56.0	44.0
#20	**0.85**	40.8	66.0	34.0
#40	**0.425**	33.1	74.1	25.9
#60	**0.25**	27.9	80.9	19.1
#100	**0.15**	26.4	87.3	12.7
#200	**0.075**	23.2	93.0	7.0
PAN	**-**	28.8	100.0	0.0
Total:		409.7		

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	43'-45'	
Purpose:	Well Design	
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	CT	Date: 9-22-98

Wt of dry sample + container	221.0
Wt of container	17.9
Wt of dry sample	203.1

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	110.0	54.9	45.1
#10	**2**	20.8	65.3	34.7
#20	**0.85**	19.6	75.1	24.9
#40	**0.425**	17.7	83.9	16.1
#60	**0.25**	11.2	89.5	10.5
#100	**0.15**	7.2	93.1	6.9
#200	**0.075**	6.0	96.1	3.9
PAN	**-**	7.8	100.0	0.0
Total:		200.3		

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	48'-50'	
Purpose:	Well Design	
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	JT	Date: 9-22-98

Wt of dry sample + container	281.8
Wt of container	17.9
Wt of dry sample	263.9

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	207.1	78.6	21.4
#10	**2**	18.9	85.7	14.3
#20	**0.85**	9.7	89.4	10.6
#40	**0.425**	8.5	92.6	7.4
#60	**0.25**	5.8	94.8	5.2
#100	**0.15**	5.6	97.0	3.0
#200	**0.075**	4.4	98.6	1.4
PAN	-	3.6	100.0	0.0
Total:		263.6		

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	53'-55'	
Purpose:	Well Design	Depth: 59'-61'
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	JT	Date: 9-22-98

Wt of dry sample + container	219.7
Wt of container	17.9
Wt of dry sample	201.8

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	80.7	40.0	60.0
#10	**2**	23.1	51.5	48.5
#20	**0.85**	21.0	61.9	38.1
#40	**0.425**	34.8	79.1	20.9
#60	**0.25**	16.0	87.1	12.9
#100	**0.15**	10.0	92.0	8.0
#200	**0.075**	7.5	95.7	4.3
PAN	**-**	8.6	100.0	0.0
Total:		201.7		

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	55'-57'	
Purpose:	Well Design	
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	JT	Date: 9-22-98

Wt of dry sample + container	323.1
Wt of container	17.9
Wt of dry sample	305.2

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	1.9	0.6	99.4
#10	**2**	3.7	1.8	98.2
#20	**0.85**	7.1	4.2	95.8
#40	**0.425**	20.7	10.9	89.1
#60	**0.25**	59.2	30.3	69.7
#100	**0.15**	91.2	60.1	39.9
#200	**0.075**	73.0	84.0	16.0
PAN	**-**	48.9	100.0	0.0
Total:		305.7		

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	57'-59'	
Purpose:	Well Design	
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	JT	Date: 9-22-98

Wt of dry sample + container	330.1
Wt of container	17.9
Wt of dry sample	312.2

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	8.5	2.7	97.3
#10	**2**	24.7	10.6	89.4
#20	**0.85**	49.8	26.6	73.4
#40	**0.425**	76.7	51.2	48.8
#60	**0.25**	59.3	70.2	29.8
#100	**0.15**	40.9	83.3	16.7
#200	**0.075**	25.7	91.5	8.5
PAN	**-**	26.5	100.0	0.0
Total:		312.1		

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	59'-61'	
Purpose:	Well Design	Depth: 59'-61'
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	JT	Date: 9-22-98

Wt of dry sample + container	372.9
Wt of container	17.9
Wt of dry sample	355.0

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	11.8	3.3	96.7
#10	**2**	23.1	9.8	90.2
#20	**0.85**	60.5	26.9	73.1
#40	**0.425**	94.7	53.6	46.4
#60	**0.25**	73.2	74.2	25.8
#100	**0.15**	49.6	88.2	11.8
#200	**0.075**	27.2	95.8	4.2
PAN	-	14.8	100.0	0.0
Total:		354.9		

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	61'-63'	
Purpose:	Well Design	
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	JT	Date: 9-22-98

Wt of dry sample + container	292.0
Wt of container	17.9
Wt of dry sample	274.1

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	4.9	1.8	98.2
#10	**2**	1.7	2.4	97.6
#20	**0.85**	4.4	4.0	96.0
#40	**0.425**	20.2	11.4	88.6
#60	**0.25**	57.6	32.3	67.7
#100	**0.15**	77.8	60.7	39.3
#200	**0.075**	60.3	82.7	17.3
PAN	**-**	47.6	100.0	0.0
Total:		274.5		

LENARD ENGINEERING, INC.
Civil, Environmental and Hydrogeological Consultants
1066 Storrs Rd. Storrs, CT. 06268
(860) 429-5400

GRAIN SIZE ANALYSIS - Mechanical

Project:	UCONN Well #4 Reconstruction	Job: # 96-350.3
Location:	Storrs, CT	
Sample:	63'-65'	
Purpose:	Well Design	
Sampled By:	Laframboise Well Drilling	Date:
Tested By:	JT	Date: 9-22-98

Wt of dry sample + container	212.1
Wt of container	17.9
Wt of dry sample	194.2

Sieve No.	**Diameter (mm)**	Weight Retained (g)	Culminative % retained	% passing
#4	**4.75**	2.5	1.3	98.7
#10	**2**	10.9	6.9	93.1
#20	**0.85**	10.6	12.4	87.6
#40	**0.425**	6.6	15.8	84.2
#60	**0.25**	19.4	25.8	74.2
#100	**0.15**	54.5	53.8	46.2
#200	**0.075**	57.9	83.7	16.3
PAN	-	31.7	100.0	0.0
Total:		194.1		

N

Goulds Pumps
ID & B Pump

Goulds Turbine Pump Selection Ver 6.00
12/29/98

PUMP DATA SHEET
Goulds Turbine 60 Hz

Selection file: (untitled)
Catalog: TURB60.MPC v 1.3

Curve: 3108

Design Point: Flow: 450 US gpm
Head: 550 ft

Fluid: Water
Temperature: 60 °F
SG: 1
Viscosity: 1.122 cP
Vapor pressure: 0.2568 psi$_a$
Atm pressure: 14.7 psi$_a$

Pump: TURBINE - 1800
Speed: 1760 rpm
Size: 10RJLO (15 stages)
Dia: 5.375 in

Limits: Temperature: — °F
Pressure: 430 psi$_g$
Sphere size: 0.88 in
Power: — bhp

NPSHa: — ft

Specific Speed: Ns: 2760 Nss: —

Piping:
System: —
Suction: — in
Discharge: — in

Dimensions: Suction: 6 in Discharge: 6 in

Vertical Turbine: Bowl Dia: 9.5 in Max Lateral: 0.75 in
Thrust K Factor: 7

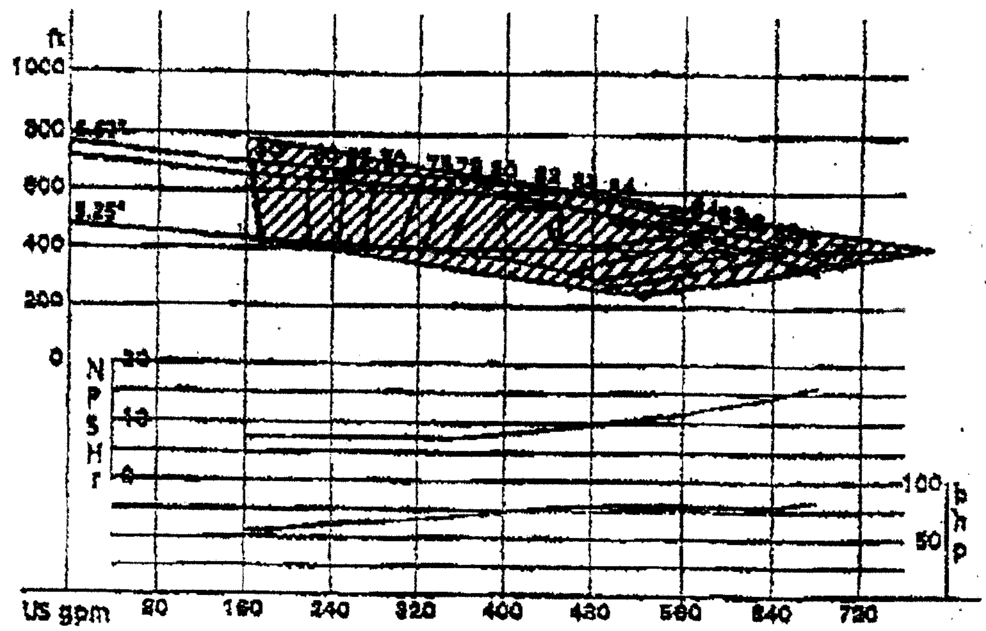
Motor: 100 hp Speed: 1800 Frame: 405T
NEMA Standard TEFC Enclosure
sized for Max Power on Design Curve

8" Disch dia also avail:

— Data Point —
Flow: 450 US gpm
Head: 550 ft
Eff: 82.8%
Power: 75.7 bhp
NPSHr: 9.14 ft

-- Design Curve --
Shutoff Head: 721 ft
Pressure: 312 psi$_g$
Min Flow: - US gpm
BEP: 84% eff
@ 513 US gpm
NOL Pwr: 83.5 bhp
@ 620 US gpm

-- Max Curve --
Max Pwr: 91.4 bhp
@ 703 US gpm



— PERFORMANCE EVALUATION —

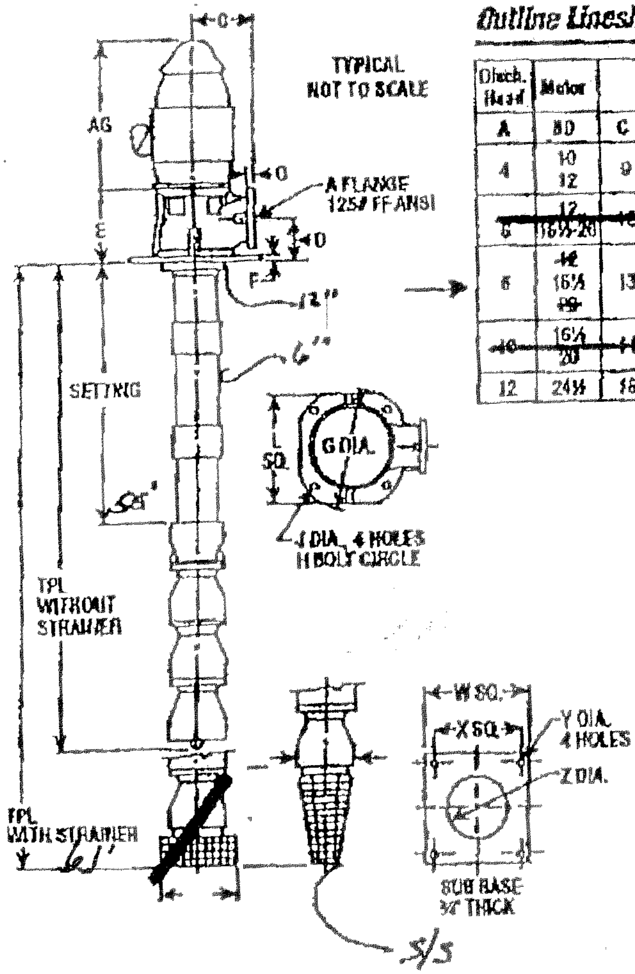
Flow US gpm	Speed rpm	Head ft	Pump %eff	Power bhp	NPSHr ft	Motor %eff	Motor hp	Hrs/yr	Cost /KW
540	1760	484	83.7	78.9	11.2				
450	1760	550	82.8	75.7	9.14				
360	1760	603	78.8	69.5	7.83				
270	1760	630	68.4	62.7	7.5				
180	1760	655	52.4	56.8	7.3				

GOULDS PUMPS, INC.
TURBINE DIVISION
LUBBOCK, TEXAS 79415

300.2C.

Lineshaft Turbine Threaded Column "A" Style Discharge Head

Effective April 3, 1995



Outline Lineshaft Turbine "A" Head – Motor (threaded column)

Disch. Head	Motor	Discharge Head									Optional Sub Base			
A	BD	C	D	E	F	G	H	J	L	Q	W	X	Y	Z
4	10 12	9	5	13½	⅝	NA	14	⅝	14	¾	18	16	⅝	12
~~6~~	~~12 16½-20~~	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	~~12~~ 16½ ~~20~~	13	7½	17½	1½	23½	21½	⅝	20	1	24	22	⅝	18
~~10~~	16½ 20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	24½	16	10½	23	1½	32	30	¾	28	1¼	34	31	1	24

Motor Data

Motor Mfg. US Furn. By Goulds
HP 100 RPM 1770 BD 16½
Phase 3 Cycle 60 Volts 460
Frame 404TP Encl. WPI AG 41⅛
☒ VHS Thrust 6700 Motor OD 36 15/16
Motor Bore
☐ VSS Mtr. Shaft Keyway
Head Bowls Column

Optional Strainer
☐ Basket Strainer ☒ Optional Sub Base
☒ Cone Strainer
NOTE: Dimensions are in inches.

Goulds Serial No.
Customer D+S
Customer P.O.
Branch Order No.
Equip. or Item
Service ~~Fenton~~ Wellfield Willimantic

Pump Size	No. of Stages	Imp. Dia.	BHP	Qty.
10RJO	15			1

Liquid	GPM	TDH	SP. GR.	Temp.
Water	450	530	1.0	Amb.

Lube	Bowl Bearing	Line Shaft Bearing
☒ Water	Brz.	Non Rubber
☐ Oil	Bowl Shaft Dia.	Line Shaft Dia.
☐	1½	1½

Column Size	No. of Columns	Bearing Span
6	6	60/120

Special Construction

CERTIFIED CORRECT
☐ FOR APPROVAL ☐ FOR RECORD
By LRG Date

Drawing No.	Rev.	Date

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. PRINTED IN U.S.A.

SB CHURCH

49 Great Hill Road, Oxford, CT 06478
Tel: 203.888.2132

May 2, 2019

To: Brant Buhler
Connecticut Water Company
New England Water Utility Services
93 West Main Street
Clinton, CT 06413
Tel: 860-486-1081
Cell 860 622 9564
Fax: 860 669 0987
Email: BBuhler@ctwater.com

Ref: Test Performance of the UCONN Willimantic Well 2 and 3 and the Performance of the Well Pumps.

Dear Brant,

We have completed the performance testing of UCONN Willimantic Well No 2 and No 3 per our letter of April 11, 2019. Enclosed for your records is the performance data for these two wells and pumps, and the vibration levels on the 100 horsepower motor at Well No 3.

We have enclosed a copy of the original pump curve with the performance of the existing well pump also plotted at 60 hertz. In Well No 2, at 220 gpm, the pressure had decreased by 5 percent. In Well No 3, at 600 gpm, the pressure had decreased by 24 percent. We proposed that this turbine pump be repaired in our proposal of May 1, 2019.

We appreciate your assistance in helping us complete this work.

Very truly,

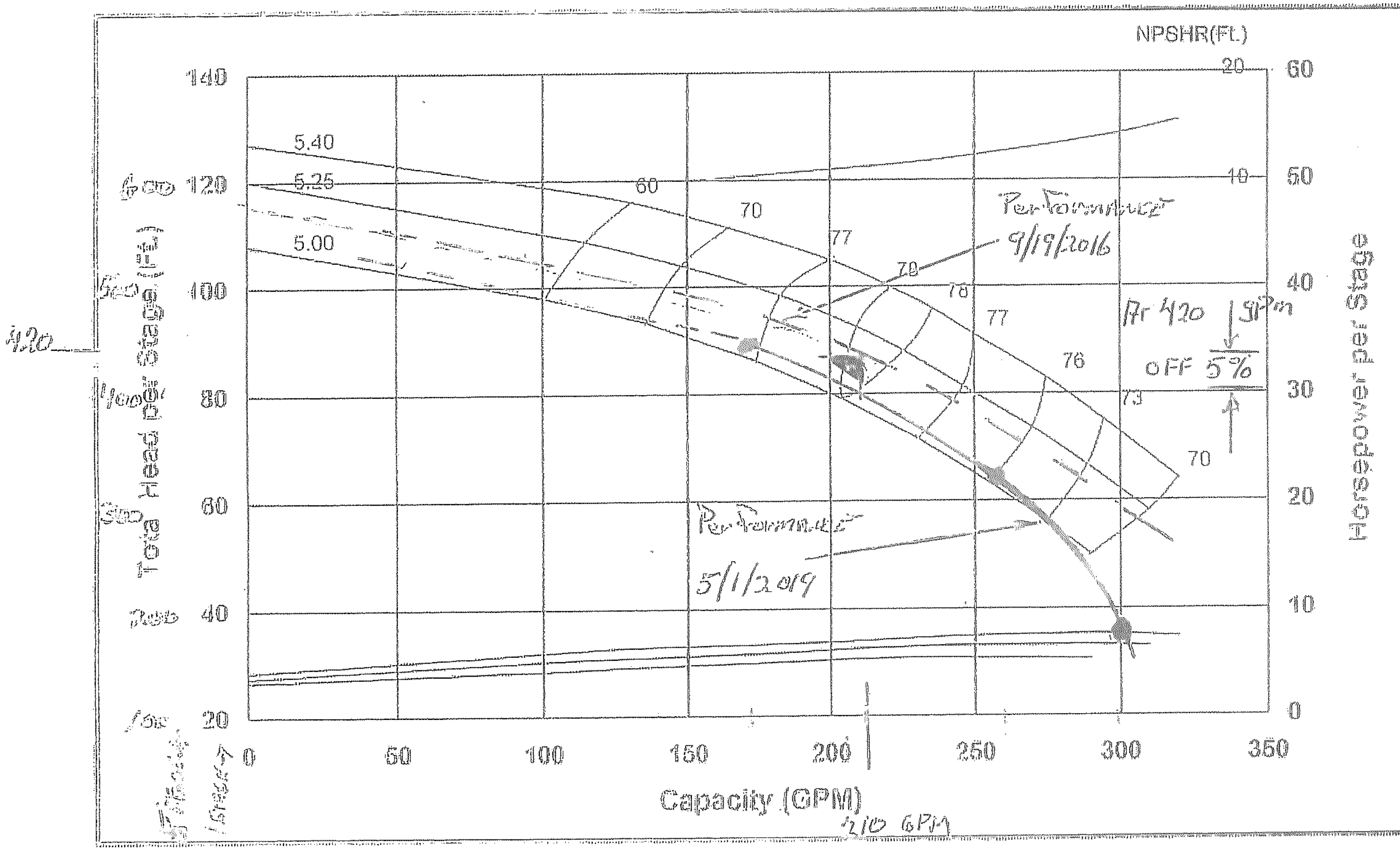
Pete Duncan

Pete Duncan
Duncan.Pete@wseinc.com

MODEL 7WALC (Effective June 1, 2006)

GOULDS PROPOSAL NO	GOULDS S O NO	INQUIRY NO	CUSTOMER P.O. NO	P.O. DATE	ITEM NO	CUSTOMER
						UCONN - Willimantic Well 2

PROJECT	SERVICE	GPM CAPACITY	FT. TDH	% EFFICIENCY	RPM
5 Stage 7WALC	30 HP. Submersible	210	420		3600



Curve No.	E6207WBPC0
Model	7WALC
RPM	3450
EFFICIENCY CORRECTION	
1-STAGE	-2.0
2-STAGE	-1.0
3-STAGE	-0.5
4-STAGE	0.0
Impeller	ENCLOSED
Ns =	1655
K =	2.63 LBS/FT
K(Bal.)=	N/A
Bowl O D	7.13"
Bowl Lateral	0.50"
Max. PSI	364
Disch size	4", 5", 6"

TURBINE OPERATIONS
Lubbock, Texas

BOWL PERFORMANCE CURVE BASED ON PUMPING CLEAR, NON-AERATED WATER. RATED POINT ONLY IS GUARANTEED. CURVES REPRESENT SINGLE STAGE PERFORMANCE BASED ON TEST OF MULTI-STAGE BOWL ASSEMBLY. EFFICIENCY CORRECTION IS REQUIRED FOR LESSER STAGES.

MODEL 7WAHC (Effective June 1, 2006)

UCONN

Record of Pump Performance

Willimantic Well No 2

Date May 1 2019

Static water level 16.65

Flow measured by Existing Meter Pitot Orifice Other (circle one)

Horsepower 30 HP Submersible

Name plate amps 39.5

Depth gauge tube length Approx 60 FT

Col 1 Flow Rate, gpm	Col 2 Depth to Water, ft	Col 3 Drawdown (Col 2 minus static)	Col 4 Specific Capacity (Col 1/ Col 3)	Col 5 Discharge Pressure, psi	Col 6 Total Discharge Head, ft (Col 5 x 2.31 plus Col 2)	Hertz Readings	GPM at 60 Hertz	TDH at 60 Hertz
0		Do Not Take	Shut off	Pressure -	Too High			
150	30.45	13.80	10.86	135	342	52	172	451
225	37.15	20.50	10.97	88	240	52	258	317
260	42.25	25.60	10.15	38	130	52	299	172

Note: At 210 GPM Pressure was off by 5% at 60 Hertz.
See Attached Pump Curve.

May 2 2019

Pump Data Sheet - Turbine 60 Hz

GOULDS WATER TECHNOLOGY
a xylem brand

Company: Xyleminc
Name:
Date: 4/23/2019

Customer: Conn Water Co.
Order No:

UCONN - Willimantic Well 3

Pump:

Size: 11CLC (9 stage)

Type: Lineshaft
Synch speed: 1800 rpm

Speed: 1770 rpm
Dia: 7.875 in

Curve: E6411CFPC1

Impeller:

Specific Speeds:

Ns: 2230
Nss: —

Dimensions:

Suction: —
Discharge: —

Vertical Turbine:

Bowl size: 11 in
Max lateral: 0.88 in
Thrust K factor: 7 lb/ft

Search Criteria:

Flow: 650 US gpm

Head: 500 ft

Fluid:

Water
Density: 62.32 lb/ft³
Viscosity: 0.9946 cP

Temperature: 68 °F
Vapor pressure: 0.3391 psi a
Atm pressure: 14.7 psi a

NPSHa: —

Motor:

Standard: NEMA
Enclosure: WPI

Size: 125 hp
Speed: 1800
Frame: 405

Sizing criteria: Max Power on Design Curve

Pump Limits:

Temperature: —
Pressure: —
Sphere size: 0.68 in

Power: —
Eye area: —

— Data Point —

Flow:	650 US gpm
Head:	503 ft
Eff:	85.1%
Power:	96.8 hp
NPSHr:	8.5 ft

— Design Curve —

Shutoff head:	694 ft
Shutoff dP:	300 psi
Min flow:	170 US gpm

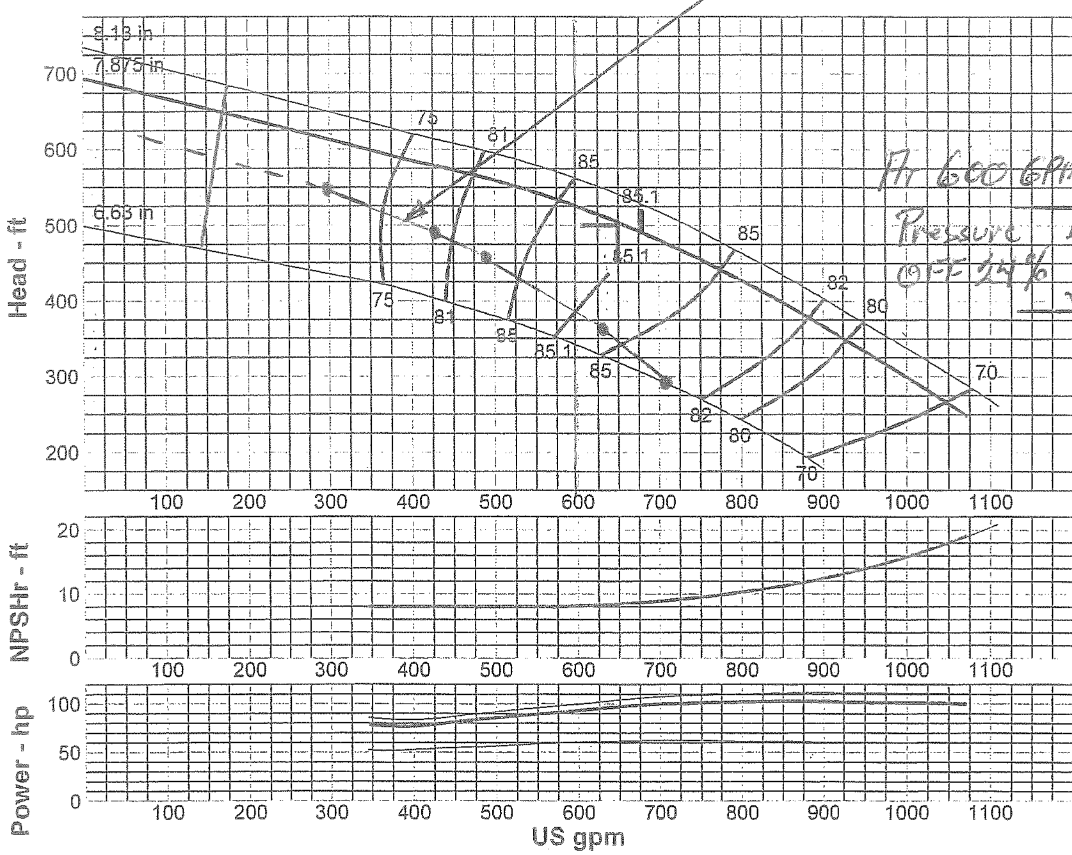
BEP: 85.1% @ 679 US gpm

NOL power:
103 hp @ 882 US gpm

— Max Curve —

Max power:
112 hp @ 901 US gpm

Performance 5/1/2019



Suction Size-8" Discharge Sizes-6",8". Curves are certified for water at 60°F only. Consult factory for performance with any other fluid.

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
780	1770	438	84.8	102	9.98
650	1770	503	85.1	96.8	8.5
520	1770	552	82.8	87.2	8.02
390	1770	588	75.2	76.9	7.99
260	1770	623	49.4	82.5	7.99

UCONN

Record of Pump Performance

WILLIMANTIC Well No. 3

Date MAY 1 2019

Static water level 15.05

Flow measured by Existing Meter Pitot Orifice Other (circle one)

Horsepower 100

Name plate amps 114

Depth gauge tube length N/A

Col 1 Flow Rate, gpm	Col 2 Depth to Water, ft	Col 3 Drawdown (Col 2 minus static)	Col 4 Specific Capacity (Col 1/ Col 3)	Col 5 Discharge Pressure, psi	Col 6 Total Discharge Head, ft (Col 5 x 2.31 plus Col 2)	HERTZ READINGS	GPM AT 60 HERTZ	TDH AT 60 HERTZ
0	DO NOT TAKE SHUTOFF PRESSURE - TOO HIGH							
264	20.15	5.1	51.76	172	417	52	304	550
360	21.85	6.8	54.11	151	370	52	423	488
422	22.77	7.72	54.66	140	346	52	485	456
550	24.94	9.89	55.61	108	274	52	632	361
616	26.11	11.06	55.69	85	222	52	708	293

NOTE: AT 600 gpm pressure WAS OFF by 24% at 60 HERTZ.
SEE ATTACHED PUMP CURVE.

Pump Data Sheet - Turbine 60 Hz

Company: xylem
Name:
Date: 3/3/2016

Customer:
Order No:

Powered By PUMP-FLO

Wells 1 and 3

Pump:

Size: 9RCHO (11 stage)

Type: Lineshaft	Speed: 1770 rpm
Synch speed: 1800 rpm	Dia: 6.88 in
Curve: E6409CHPC1	Impeller:
Specific Speeds:	Ns: 2300
	Nss: ---
Dimensions:	Suction: ---
	Discharge: ---
Vertical Turbine:	Bowl size: 9.25 in
	Max lateral: 0.88 in
	Thrust K factor: 7 lb/ft

Search Criteria:

Flow: 584 US gpm
Head: 500 ft

Fluid:

Water	Temperature: 68 °F
SG: 1	Vapor pressure: 0.3391 psi a
Viscosity: 0.9946 cP	Atm pressure: 14.7 psi a
NPSHa: ---	

Motor:

Standard: NEMA	Size: 125 hp
Enclosure: TEFC	Speed: 1800
	Frame: 444T

Sizing criteria: Max Power on Design Curve

Pump Limits:

Temperature: 120 °F	Power: ---
Pressure: 400 psi g	Eye area: ---
Sphere size: 0.56 in	

---- Data Point ----

Flow:	584 US gpm
Head:	501 ft
Eff:	84.7%
Power:	87.2 hp
NPSHr:	9.49 ft

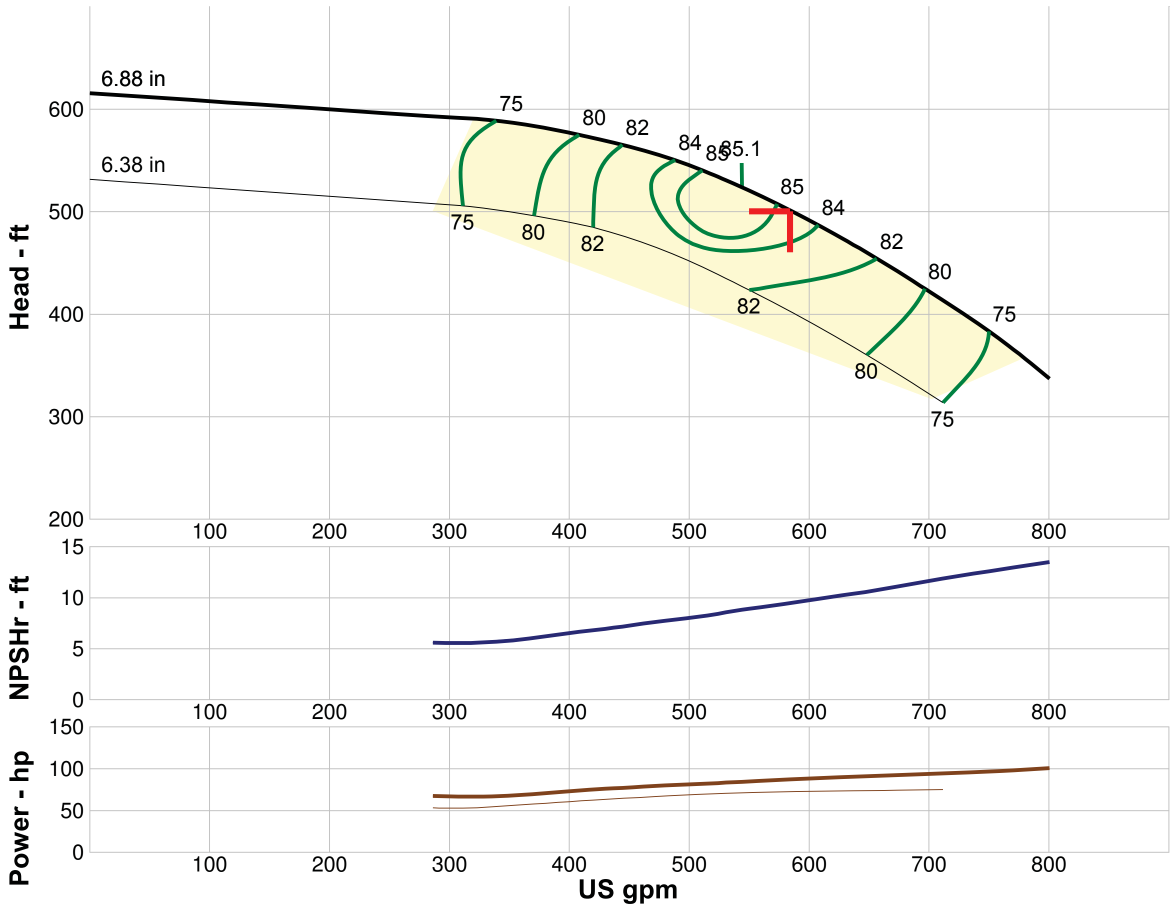
---- Design Curve ----

Shutoff head:	616 ft
Shutoff dP:	266 psi
Min flow:	---

BEP: 85.1% @ 544 US gpm
NOL power:
101 hp @ 800 US gpm

-- Max Curve --

Max power:
101 hp @ 800 US gpm



Curves are certified for water at 60°F only. Consult factory for performance with any other fluid.

Performance Evaluation:

Flow US gpm	**Speed** rpm	**Head** ft	**Efficiency** %	**Power** hp	**NPSHr** ft
701	1770	421	79.6	93.7	11.7
584	1770	501	84.7	87.2	9.49
467	1770	557	83	79.1	7.54
350	1770	587	75.8	68.3	5.84
234	1770	---	---	---	---

APPENDIX H

DPH Worksheets for Calculation of Safe Yield, Available Water, and Margin of Safety

STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH
DRINKING WATER SECTION

WORKSHEET FOR DETERMINATION OF SAFE YIELD

Applicable Regulations:
RCSA Section 25-32d-1a (30): "Safe yield" means the maximum dependable quantity of water per unit of time which may flow or be pumped continuously from a source of supply during a critical dry period without consideration of available water limitations.

Background:
Water companies required to submit a water supply plan are required to evaluate the water supply needs in their service area and propose a strategy to meet such needs. Part of this evaluation includes the determination of the calculation of the safe yield of each source of supply in accordance with Section 25-32d-4 of the Regulations of Connecticut State Agencies (RCSA). This application covers all of the regulatory requirements required of these regulations for calculation of safe yield.

Applicability:
To be completed by public water systems supplied by surface water reservoirs or ground water wells. Public water systems whose sources of supply are exclusively from one or more interconnections with another water company(s) and do not have their own reservoir or well supplies do not need to complete this application since the safe yield does not apply to an interconnection as a source of supply.

Instructions:
Provide the public water system (PWS) name, public water system identification number (PWSID), and primary town the water system is located. For each source of supply, fill in the well or reservoir name and the associated Water System Facility Identification (WSFID). The WSFID for each source of supply can be obtained from the water quality monitoring schedules available on the Department's website. (http://www.ct.gov/dph/publicdrinkingwater). The regulatory sections and subsections are provided at the heading of each section and regulatory divisions or subdivisions are provided along the right hand column for reference.

Section A – Surface Water Sources (page 3):
Complete one worksheet for each surface water source. For each source of supply, fill in the reservoir name and the associated WSFID. Check the box or boxes that correlate to the applicable regulation used for calculation of safe yield. If a yield test was determined based on a system of surface water reservoirs then list the name of the reservoir system and include the WSFID numbers for each reservoir that is part of the reservoir system. Provide the final safe yield determined for the methodology used and report the value in gallons per day. Include a copy of the *Public Water System Application For Safe Yield* for each source of supply in the appropriate section of the water supply plan being submitted for review and approval. Include all supporting documentation required of RCSA Section 25-32d-4(a)(11).

Section B – Ground Water Sources (pages 4-7):
Complete one worksheet for each groundwater source. For each source of supply, fill in the well name and the associated WSFID. Check the box or boxes that correlate to the applicable regulation used for calculation of safe yield. If a yield test was determined for multiple wells in a well field then list the name of the well field and include the WSFID numbers for well in the well field. Provide the final safe yield determined for the methodology used. Include a copy of the *worksheet for determination of Safe Yield* for each source of supply in the appropriate section of the water supply plan being submitted for review and approval. Include all supporting documentation required of RCSA Section 25-32d-4(b)(4).

Section C – Historical Records (page 8):
Complete one worksheet for each source of supply (surface water or ground water) if the determination of safe yield for the source of supply was established based on available historical records. For each source of supply, fill in the source of supply name and the associated WSFID. Check the box or boxes that correlate to the applicable regulation used for calculation of safe yield. Provide the final safe yield determined based on the historical data used and report the value in gallons per day. Include a copy of the *worksheet for determination of Safe Yield* for each source of supply in the appropriate section of the water supply plan being submitted for review and approval. Include all supporting documentation required of RCSA Section 25-32d-4(c)(3).

Section D – Previously Approved Safe Yield (page 9):
Complete one worksheet for each source of supply (surface water or ground water) if the determination of safe yield for the source of supply was established based on a previously approved safe yield. For each source of supply, fill in the source of supply name and the associated WSFID. Check the box or boxes that correlate to the applicable regulation used for calculation of safe yield. Provide the final safe yield determined based on a previously approved safe yield and report the value in gallons per day. Include a copy of the *worksheet for determination of Safe Yield* for each source of supply in the appropriate section of the water supply plan being submitted for review and approval.

Section E – Other Approved Methods (page 10):
Complete one worksheet for each source of supply (surface water or ground water) if the determination of safe yield for the source of supply was established based on other methods approved by the Department of Public Health and Department of Energy and Environmental Protection. For each source of supply, fill in the source of supply name and the associated WSFID. Check the box or boxes that correlate to the applicable regulation used for calculation of safe yield. Provide the final safe yield determined based on the other approved method used and report the value in gallons per day. Include a copy of the *worksheet for determination of Safe Yield* for each source of supply in the appropriate section of the water supply plan being submitted for review and approval. Provide documentation that both the Department of Public Health and Department of Energy and Environmental Protection approved the method being used for calculation of safe yield. Also provide the supporting data that was used to calculate the safe yield.

Certification
The public water system owner or administrative contact is requested to sign, date and print their name certifying the information submitted for safe yield is accurate to the best of their knowledge and was determined in accordance with the applicable Regulations of Connecticut State Agencies.

CALCULATION OF SAFE YIELD	
Date:	03/12/2020
PWS Name:	University of Connecticut - Main Campus
PWSID:	#CT0780021
Town:	Mansfield

A	SURFACE WATER SOURCES	
	<u>RCSA Section 25-32d-4(a)</u> **Calculation of Safe Yield for Surface Water Sources**	
☐	1. The surface water safe yield analyses was performed by an individual with a minimum of five years experience in surface water analysis and a bachelor's or advanced degree from an accredited college or university in hydrology or related engineering field, or by a professional engineer licensed in accordance with Chapter 391 of the Connecticut General Statutes with a minimum of five years experience in surface water analysis. Name of individual performing yield test: __________ ☐ Degree: __________ Years of experience in surface water analysis: __________ Accredited college or University: __________ ☐ Professional engineer licensed in accordance with Chapter 391 of the Connecticut General Statutes. P.E. License number: __________ Years of experience in surface water analysis: __________	(a)
☐	2. Safe yield shall was calculated using a mathematical mass balance methodology and was based on a ninety-nine percent dry year or a critical dry period with a 1 in 100 occurrence frequency and was based on the usable storage capacity of a reservoir which can be used without additional equipment or treatment, except that the safe yield may be less due to requirements for the passing of minimum stream flows or other release requirements.	(a)
☐	3. Safe yield was determined based upon an analysis of the stream flow for a ninety nine percent dry year assuming a seven day average flow duration since a mass balance analysis cannot be performed due to insufficient usable storage volume. (i.e.: a run of the river type situation or diversions)	(a)

WSFID	Source of Supply Name	Safe Yield (GPD):
	N/A	

CALCULATION OF SAFE YIELD	
Date:	03/12/2020
PWS Name:	University of Connecticut - Main Campus
PWSID:	#CT0780021
Town:	Mansfield

B	GROUND WATER SOURCES	
	RCSA Section 25-32d-4(b) **Safe yield of all active wells shall be computed based upon simultaneous pumping tests of all wells in the well field and adjusted for the maximum drawdown available during a critical dry period.**	
☑	1. The ground water safe yield analyses was performed by an individual with a minimum of five years experience in ground water analysis in a glaciated geomorphological setting and a bachelor's or advanced degree from an accredited college or university in a ground water related science or related engineering field, or by a professional engineer licensed in accordance with Chapter 391 of the Connecticut General Statutes with a minimum of five years experience in ground water analysis in a glaciated geomorphological setting. Name of individual performing yield test: Scott Bighinatti (analysis) ☑ Degree: BS, Natural Resources; MS, Natural Resources - Land, Water, & Air Years of experience in ground water analysis: 13 Accredited college or University: University of Connecticut ☐ Professional engineer licensed in accordance with Chapter 391 of the Connecticut General Statutes. P.E. License number: ______ Years of experience in ground water analysis: ______	(b)
☐	**RCSA Section 25-32d-4(b)(1)** 2. **The standard method of adjusting pump test data to account for critical dry period was used.** *(If the standard method was used to adjust pump test data applies, also complete either #3 or #4 below)*	
☐	3. The safe yield was computed based on a standard method of adjusting pumping test data to account for the critical dry period was based on one of the following: ☐ For all ground water sources, a multiplier of seventy-five percent, equivalent to an eighteen hour pumping day, was applied to the pumping test rate. This adjustment factor was applied for calculating and making adjustments for the critical dry period. The resulting safe yield was reported in units of both gallons per minute, and gallons per day. ☐ In addition to the critical dry period adjustment factor, an additional multiplier of ninety percent was applied to bedrock or consolidated aquifer ground water sources. Date(s) the pump test was conducted: ______	(A)
☐	4. The safe yield was computed based on pumping test data that was analyzed and adjusted for the critical dry period using methodologies appropriate to the hydrogeologic setting and published methodologies as approved by the department*. Date(s) the pump test was conducted: ______ * Include a copy of the correspondence from the Department with approval of the published methodology appropriate to the hydrogeologic setting. Analytical methods used in this section shall account for all criteria in RCSA Section 25-32d-4(b)(1)(B)(i) through 25-32d-4(b)(1)(B)(v). Please note that previous approval of a water supply plan where safe yield was calculated using a published methodology does not in itself qualify as Department approval of the methodology.	(B)

☑	**<u>RCSA Section 25-32d-4(b)(2)</u>** 5. **An alternative method for analyzing pumping test data was completed at the water company's option because stabilized water levels were above the pump intake or water levels did not stabilize and predicted water levels are above the pump intake after an extrapolation of drawdown over 180 days of pumping.**	
☑	6. The alternative method that was used to indicate the additional yield of the well above the installed pumping capacity at the time of the pumping test showed: ☑ a) Stabilization occurred above the pump intake. ☑ b) Stabilization did not occur; however the pump test shows that the aquifer has sufficient storage to sustain pumping at the higher rate during the critical dry period and is intended to indicate the maximum well yield attainable with pump replacement, modification, or increased capacity. ☑ c) The alternative method used conforms to analytical methodologies or modeling techniques appropriate to the hydrogeological setting and published methodologies as <u>approved by the department</u>* to predict water levels at the higher pumping rate. ☑ d) The analysis technique took into account mutual interference effects on all wells located in the same well field. ☑ e) Corrections for the critical dry period were performed in accordance with Section 25-32d-4(b)(1)(A) or Section 25-32d-4(b)(1)(B) of the Regulations of Connecticut State Agencies. * Include a copy of the correspondence from the Department with approval of the published methodology appropriate to the hydrogeologic setting. Please note that previous approval of a water supply plan where safe yield was calculated using a published methodology does not in itself qualify as Department approval of the methodology.	(b)(2) (A) (B) (C)
	<u>RCSA Section 25-32d-4(b)(3)</u> **A well field pumping test used to determine safe yield shall satisfy the following criteria:** *Note: All criteria in this section are applicable to the standard method [RCSA Section 25-32d-4(b)(1)] and the alternative method [RCSA Section 25-32d-4(b)(2)]for establishing a safe yield unless variation(s) are used per RCSA Section 25-32d-4(b)(3)(K).*	
☐	7. A pumping test was conducted with all wells in the well field pumping simultaneously to determine time-drawdown characteristics of the pumped wells.	(A)
☑	8. The rate of pumping of all wells was constant throughout the pumping test.	(A)
☑	9. Each well was individually metered during the pump test.	(A)
☑	10. The well field has more than one well and existing data from individual, non-simultaneous pumping tests of each well in the well field that meet the other pumping test requirements were utilized, provided corrections were made for mutual interference.	(A)
☑	11. The pumping test was conducted for at least the minimum duration required in Section 19-13-B51k of the Regulations of Connecticut State Agencies.	(B)
☑	12. The water level in the well(s) stabilized for the last twelve hours prior to completion of the pumping test.	(C)
☐	13. Stabilization was not achieved after the required pumping test duration therefore the pumping test was extended.	(C)
☑	14. Stabilization was not achieved after the required pumping test duration therefore an analysis and extrapolation of pumping test drawdown versus time data was performed to show whether there is sufficient storage in the aquifer to sustain the pumping rate for 180 days of continual operation and maintain water levels above the pump intake. ☑ The 180 day projection shows the water level would be above the pump intake.	(C)

	☑ The 180 day projection shows the water level would be at or below the pump intake; therefore a reduced pumping rate was calculated based on specific capacity at the end of the pump test so the water level remains above the pump intake. Specific capacity used to calculate reduced pumping rate (gpm/foot): Well #2 - 8.9 gpm/ft	
☐	15. Drawdown tests were run simultaneously for all wells located in the same wellfield.	(D)
☑	16. Drawdown tests were not run simultaneously for all wells located in the same wellfield because interference effects during the drawdown tests were: ☐ minimal (typically demonstrated through use of hydrographs from the pumping test) ☑ estimated through use of analytical methods and/or models	(D)
☐	17. The maximum pumping rate was limited by the Department due to concern that contaminants would be drawn into the well field during the test.	(E)
☑	18. The pump test was conducted following a period of five days during which precipitation did not exceed one-half inch during any twenty-four hour period, and one inch during any seventy-two hour period.	(F)
☑	19. Precipitation at the site of the pumping test was monitored daily beginning one week prior to the start-up of pumping through completion of the test using equipment capable of measuring precipitation to within one hundredth (0.01) of one inch.	(F)
☑	20. Water level measurements were collected daily for at least one week prior to the start of the pump test from: ☑ pumping well ☑ nearby monitoring wells	(F)
☑	21. For a period of 3 days prior to the start of the pump test, the existing developed wells in the well field were: ☑ shut down ☐ not shut down because it was not feasible; therefore the Department approved a minimum pumping rate during the background shut down period.	(F)
☑	22. Drawdown measurements in each pumping well were recorded: ☐ hourly ☑ Other frequency that accurately measures drawdown to properly document the trend leading up to stabilization and for proper analysis of pumping test data. Other frequency: Varies by test	(G)
☑	23. Ground water level measurements were recorded with: ☑ a measuring tape ☑ an electric line ☑ a pressure transducer accurate to two one hundreds (0.02) of a foot ☐ airline readings were used because direct access to the water level was not feasible without performing major modifications to the well.	(H)
☑	24. The water withdrawn from the well was discharged to an area that did not interfere with the pump test.	(I)
☑	25. All surface water bodies within 500 feet of the pumping well were measured to the nearest two one hundredths (0.02) of a foot at least twice daily during the pumping test.	(J)
☐	26. Variations in the criteria outlined in #7 through #25 of this document were used to calculate safe yield to demonstrate there was no noticeable effect or the effect was negated through use of analytical methods. Check all the numbered boxes associated with the criteria used to determine safe yield in which a variation was used: ☑7 ☑8 ☐9 ☐10 ☑11 ☐12 ☐13 ☐14 ☐15 ☐16 ☐17 ☑18 ☑19 ☑20 ☑21 ☑22 ☐23 ☐24	(K)

	For each box check provide supporting documentation with this application to demonstrate why the variation applies. The Department will review the supporting data and make a decision if the supporting documentation for any variations used are adequate and justified.	
☐	27. Data from an induced infiltration test performed in accordance with subparagraph (B) of subdivision (4) of subsection (d) of Section 22a-354b-l of the Regulations of Connecticut State Agencies regarding level A mapping were used to fully meet the pumping test requirements.	(K)
	RCSA Section 25-32d-4(b)(4) **Submittal Requirements**	
☑	28. The following items have been submitted in support of the calculated ground water safe yield: ☑ static water level before pumping; ☑ date, time and duration of pump test; ☑ pumping rate in gallons per minute; ☑ drawdown records of time and measured water; ☑ date, time and amounts of precipitation; ☑ location of discharge point; ☑ well driller's log; ☑ physical well data regarding well construction, screen lengths and intervals, well development and diameter; ☑ graphs of drawdown or depth to water versus time plotted arithmetically if stabilization was achieved, or plotted on semi-logarithmic paper and extrapolated to 180 days if stabilization was not achieved; ☑ static water levels without any pumping and stabilized water levels during continuous pumping; ☑ rated pump capacity and pump curves; ☑ limitations on pumping, if any; ☑ other pertinent ground water modeling or testing data if utilized; ☑ justification, description and reference information for use of selected methodology.	 (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N)

WSFID	Source of Supply Name	Safe Yield (GPD):
1321	Fenton River Wellfield - Well A (Emergency)	N/A
1322	Fenton River Wellfield - Well B	905,500
1323	Fenton River Wellfield - Well C	776,100
1324	Fenton River Wellfield - Well D	486,200
1461	Willimantic River Wellfield - Well #1	604,500
1462	Willimantic River Wellfield - Well #2	302,700
1463	Willimantic River Wellfield - Well #3	594,300
1464	Willimantic River Wellfield - Well #4	674,800

CALCULATION OF SAFE YIELD	
Date:	03/12/2020
PWS Name:	University of Connecticut - Main Campus
PWSID:	#CT0780021
Town:	Mansfield

C	USE OF HISTORICAL RECORDS	
	RCSA Section 25-32d-4(c) **Where sufficient historical records are available, data on the safe yield of any sources available during a critical dry period may be used if approved by the Department.**	
☐	1. Data on the safe yield of sources of supply during a critical dry period are being provided for consideration by the Department for approval. The following criteria are being met with the data being submitted for Department review: ☐ For existing wells, production records spanning a dry period of low stream flow recharge and below normal precipitation recharge. ☐ A sufficient margin of safety is maintained as demonstrated of Section 25-32d-3(b)(8) of the Regulations of Connecticut State Agencies. ☐ A new or expanded source of supply or a new or revised diversion permit is not needed within the five year planning period. ☐ The well or wells have consistently produced the average rate over a multi-year period of record on an annual basis and over the seasonal low water table period extending from July to November. ☐ Historic production records are proposed to be used for calculating groundwater safe yield, therefore critical period adjustments have been applied in accordance with Sections 25-32d-4(b)(1)(A) and (B).	(1)
☐	2. The average production rate is based upon metered production records at each individual source of supply and the approved yield does not exceed the current installed pump or treatment capacity.	(2)
☐	3. The following data is being provided to the department: ☐ historic long term production records encompassing a representative dry period, including average day, maximum month average day, and peak day withdrawal rates. ☐ available information listed in RCSA Section 25-32d-4(a)(11) for surface water supplies. ☐ available information listed in RCSA Section 25-32d-4(b)(4) for groundwater supplies.	(3)

WSFID	Source of Supply Name	Safe Yield (GPD):

CALCULATION OF SAFE YIELD	
Date:	03/12/2020
PWS Name:	University of Connecticut - Main Campus
PWSID:	#CT0780021
Town:	Mansfield

D	PREVIOUSLY APPROVED SAFE YIELD
	RCSA Section 25-32d-4(d)
☐	Safe yield analyses previously performed that substantially meets the requirements of Section 25-32d-4 of the Regulations of Connecticut State Agencies has been submitted in lieu of the study required. Please note: Submittal of data for justification of safe yield under this section will be reviewed by the Department on a case by case basis.

WSFID	Source of Supply Name	Safe Yield (GPD):

CALCULATION OF SAFE YIELD	
Date:	03/12/2020
PWS Name:	University of Connecticut - Main Campus
PWSID:	#CT0780021
Town:	Mansfield

E	OTHER METHODS
	RCSA Section 25-32d-4(f)
☐	Other methods for determining safe yield that are approved by the Department of Public Health and the Department of Energy and Environmental Protection and ensure an adequate water supply are being provided.

WSFID	Source of Supply Name	Safe Yield (GPD):

My signature below certifies that the information provided on this worksheet for determination of safe yield for the public water system and source(s) of supply indicated is accurate to the best of my knowledge and complies with the applicable Regulations of Connecticut State Agencies.

Stanley L. Nolan Digitally signed by Stanley L. Nolan DN: cn=Stanley L. Nolan, o=University of Connecticut, ou=Facilities Operations & Building Services, email=Stanley.Nolan@uconn.edu, c=US Date: 2020.07.06 16:57:03 -04'00' 07/06/2020

(Signature of public water system Owner or Administrative contact) (Date)

Stanley Nolan

(Print or type name)

STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

DRINKING WATER SECTION

WORKSHEET FOR DEMONSTRATION OF AVAILABLE WATER

Applicable Regulations:
Regulations of Connecticut State Agencies (RCSA) Section 25-32d-1a(4): "Available water" means the maximum amount of water a company can dependably supply, taking into account the following reductions applied to safe yield: any limitations imposed by hydraulics, treatment, well pump capabilities, reductions of well yield due to clogging that can be corrected with redevelopment, transmission mains, permit conditions, source construction limitations, approval limitations, or operational considerations; and the safe yield of active sources and water supplied according to contract, provided that the contract is not subject to cancellation or suspension and assures the availability of water throughout a period of drought and that the supply is reliable.

RCSA Section 25-32d-4(d): The reduction in safe yield imposed by any constraints such as hydraulic considerations, system losses, treatment limitations, or interference effects shall be considered in the calculation of available water for all active sources.

Background:
Water companies required to submit a water supply plan are required to provide an analysis of the relationship between available water and average daily demands per RCSA Section 25-32d-3(b)(7). This application will ensure a water company is accounting for all required limitations of the system that need to be deducted from a safe yield. The resulting available water quantity will be used to calculate a system's margin of safety for the five, twenty and fifty year planning periods. It is important that accurate and up to date safe yield data and accurate accounting of all system limitations are used to allow for proper planning of new sources to ensure a continuous pure and adequate supply to customers.

Instructions:
Provide the public water system (PWS) name, public water system identification number (PWSID), and primary town the water system is located. In the two far left columns, list the name and Water System Facility Identification (WSFID) for each active source of supply. The Water System Facility Identification (WSFID) numbers can be obtained from the water system's Water Quality Monitoring Schedule, which is available on the Drinking Water Section's website: http://www.ct.gov/dph/publicdrinkingwater. Sources of supply listed must include surface water sources, ground water sources and interconnections with other water companies. Please note, inactive sources of supply must not be included since available water calculations only account for active sources of supply that meet the definition of RCSA Section 25-32d-1a (a)(2). ''Active source'' means a department approved source of supply which meets state and federal water quality standards, with adequate department approved treatment facilities as needed, or for which compliance schedules are in place. An active source is one that is permanently connected to the system and may include, but need not be limited to, a seasonal or standby source of supply that may be used intermittently or on a partial year basis. Emergency interconnections must not be counted as a source of supply to be used for purposes of demonstrating available water.

A. Available water from sources of supply:
For each active source of supply, determine if a limiting factor exists that limits the safe yield and list the maximum volume of water that c column "a" through "k". If the limiting factor in the column is not applicable to the source of supply listed then leave the field in the liming factory column blank. In the far right column labeled "Available Water From Source", list the lowest value from columns "a" through "k", as this will be the maximum amount of water that can be delivered. Please list all values for maximum available water in gallons per day (GPD).

a. List the safe yield listed for each active source of supply that was provided in the *Department of Public Health Drinking Water System Public Water System Application for Safe Yield.* For all ground water sources, a multiplier of seventy-five percent, equivalent to an eighteen hour pumping day, should be applied to the pumping test rate. Please note that safe yields are not applicable to sources of supply that are interconnections with other water companies; therefore this column should be left blank when the source of supply is an interconnection.
b. If applicable, for each source of supply provide the maximum volume of water that can be supplied while accounting for any hydraulic limitations.
c. If treatment is present, for each source of supply provide the maximum volume of water that can be supplied while accounting for any treatment limitations. If there are multiple treatment processes at a water treatment plant, then the treatment process with the lowest value must be used as the limiting factor.
d. If the source of supply must be pumped for the water to reach the entry point to the distribution system, provide the maximum volume of water that the current pump(s) installed can supply. Do not account for any other limitation (i.e. permits) that may impact the volume of water the pump may be restricted to accommodate. This section should only account for the maximum design capacity of the pump(s) installed for each source of supply.

e. If the source of supply is subject to clogging, provide the maximum volume of water that can be supplied from each active source of supply after redevelopment activities have been completed.
f. For each source of supply, provide the maximum volume of water that can be delivered through the transmission mains from the source of supply to the point of entry to the distribution system. If the maximum volume of water is different due to segments of piping with different pipe sizes and flows, then use the lowest volume of the pipe segments associated with the source of supply since it is the limiting factor.
g. For each source of supply that is subject to a permit, list the maximum capacity allowed by the permit in gallons per day. Permits may include but are not limited to: CT DEEP source registrations, CT DEEP source diversion permits, and CT DPH sale of excess water permits. If multiple permits exist for a single source of supply, use the lowest permitted value as this would be the limiting factor.
h. If the source of supply is limited due to source construction, list the maximum volume of water that the source of supply can provide. For example, some sources of supply are pumped at a lower withdrawal rate to maintain the water column in the well above a known fracture zone that may contribute to poor water quality.
i. If the source of supply is limited to an approved capacity, list the maximum approved capacity for each source of supply in gallons per day. An example of an approved capacity may be a well that has yield and pumping equipment capable of supplying greater than 50 gpm, but it restricted to 10-50 gpm because the well site location for the new well was approved at the lower rate to comply with separation distances to potential sources of pollution per RCSA Section 19-13-B51d.
j. If the source of supply is limited due to operational considerations, list the maximum amount of water that can be delivered to the entry point of the distribution system. If there are two sources of supply that share common electrical controls and/or permits where only one source can be operated at any given time, then the value for one of the sources of supply must be 0 GPD. The available water from sources of supply that share operational limitations where only allow one source of supply can operate at any given time cannot be added together or both included in the available water calculation.
k. If the source of supply is limited due to contractual agreements, list the maximum volume of water that can be delivered to the entry point of the distribution system.

After filling in the applicable values for each limiting factor for each source of supply, in the far right column that is labeled "Available Water from Source", fill in the lowest value from each of the limiting factor columns "a" through "k". The lowest value in the row associated with the source of supply is the available water for that source of supply. Next, add the values in the "Available Water From Source" column and put the total in bottom right hand corner of the spreadsheet. This value will be the "Total Available Water from Sources of Supply (GPD)".

B. Water sold to other water companies through interconnections:
Next, the water sold to other water companies through interconnections must be subtracted from the available water from sources of supply. In the far left column, list the name of each interconnection and associated street where water is sold to another water company. In the far right column, list the volume of water sold in gallons per day for each interconnection. Add the values of "Volume of Water Sold (GPD)" for each interconnection and put a total in the far right hand corner of the spreadsheet. This value will be the "Total volume of water sold to other water companies".

C. Available Water Calculation:
From the "Total Available Water from Sources of Supply (GPD)" (from section A of the application) subtract the "Total volume of water sold to other water companies (GPD)" (from section B of the application). Enter the total in the bottom right hand corner of the spreadsheet. This value will be the available water and the maximum amount of water a company can dependably supply while taking into account all limiting factors.

Certification of Information Submitted:
The public water system owner or administrative contact is requested to sign, date and print their name certifying the information submitted for demonstration of available water is accurate to the best of their knowledge and was determined in accordance with the applicable Regulations of Connecticut State Agencies.

STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

DRINKING WATER SECTION

WORKSHEET FOR DEMONSTRATION OF AVAILABLE WATER

Public Water System Name: University of Connecticut - Main Campus
PWSID: #CT0780021
Town: Mansfield

A. Available water from sources of supply (GPD):

WSFID	Source of Supply Name	a Safe Yield	b Hydraulic Limits	c Treatment Limits	d Well Pump	e Screen Clogging	f Trans. Mains	g Permit Limits	h Source Const.	i Approval Limits	j Operation Limits	k Contract Limits	Available Water From Source
1321	Fenton Well A	N/A		*	576,000		***	****			Emergency Only		0
1322	Fenton Well B	905,500		*	576,000		***	****			Wellfield		0
1323	Fenton Well C	776,100		*	576,000		***	****			Management		0
1324	Fenton Well D	486,200		2,232,000	509,760		2,232,000	864,000			Plan		0
1461	Willimantic Well #1	604,500		**	576,000			****					576,000
1462	Willimantic Well #2	302,700		**	302,400			****					302,400
1463	Willimantic Well #3	594,300		**	864,000			****					594,300
1464	Willimantic Well #4	674,800		2,300,000	777,600			2,307,700					674,800
61553	Interconnection - CTWC		4,556,500					1,850,000				1,500,000	1,500,000

WSFID	Source of Supply Name	a Safe Yield	b Hydraulic Limits	c Treatment Limits	d Well Pump	e Screen Clogging	f Trans. Mains	g Permit Limits	h Source Const.	i Approval Limits	j Operation Limits	k Contract Limits	Available Water From Source
A. Total Available Water from Sources of Supply (GPD):													3,647,500

B. Water sold to other water companies through interconnections:

Name of interconnection (Water Company name and street location):	Volume of Water Sold (GPD)
B. Total volume of water sold to other water companies (GPD):	0

C. Available Water Calculation:

Total Available Water from Sources of Supply (GPD) – from Section A of this application:		3,647,500
Subtract the Total volume of water sold to other water companies (GPD) – from section B of this application:	-	0
Available Water (GPD):		NaN

My signature below certifies that the information provided on this worksheet for determination of available water for the public water system and source(s) of supply indicated is accurate to the best of my knowledge and complies with the applicable Regulations of Connecticut State Agencies.

Stanley L. Nolan
Digitally signed by Stanley L. Nolan
DN: cn=Stanley L. Nolan, o=University of Connecticut, ou=Facilities Operations & Building Services, email=Stanley.Nolan@uconn.edu, c=US
Date: 2020.07.06 17:02:56 -04'00'

07/06/2020

(Signature of public water system Owner or Administrative contact) (Date)

Stanley Nolan

(Print or type name)

STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

DRINKING WATER SECTION

WORKSHEET FOR DEMONSTRATION OF MARGIN OF SAFETY (MOS)

Applicable Regulations:
Regulations of Connecticut State Agencies (RCSA) Section 25-32d-1a (a)(2): ''Active source'' means a department approved source of supply which meets state and federal water quality standards, with adequate department approved treatment facilities as needed, or for which compliance schedules are in place. An active source is one that is permanently connected to the system and may include, but need not be limited to, a seasonal or standby source of supply that may be used intermittently or on a partial year basis;
RCSA Section 25-32d-1a (a)(4): "Available water" means the maximum amount of water a company can dependably supply, taking into account the following reductions applied to safe yield: any limitations imposed by hydraulics, treatment, well pump capabilities, reductions of well yield due to clogging that can be corrected with redevelopment, transmission mains, permit conditions, source construction limitations, approval limitations, or operational considerations; and the safe yield of active sources and water supplied according to contract, provided that the contract is not subject to cancellation or suspension and assures the availability of water throughout a period of drought and that the supply is reliable.
RCSA Section 25-32d-1a (a)(5): ''Average daily demand (ADD)'' means the total annual production from all sources of supply divided by the number of days in that calendar year;
RCSA Section 25-32d-1a (a)(22): ''Margin of safety (MOS)'' means the unitless ratio of available water to demand;
RCSA Section 25-32d-1a (a)(24): ''Maximum month demand (MMD)'' means the highest water demand in a month calculated by dividing the total production from all sources of supply for each calendar month by the number of days in that month and expressed in gallons per day;
RCSA Section 25-32d-1a (a)(28): ''Peak day demand (PDD)'' means the annual maximum daily rate of water use measured in gallons per day;

Background:
Water companies required to submit a water supply plan are required to provide an analysis of the relationship between available water and average daily demand as determined for the most recent representative period of record not affected by unusual demand conditions such as drought or a significant temporary increase in demand, maximum month demand and peak day demand and the margin of safety to be maintained by the water company currently and for the five, twenty, and fifty year planning periods; and a demonstration that the margin of safety is sufficient to meet the water company's current and future needs considering factors such as potential increases or decreases in demand, the time required to bring new sources of supply on line, potential losses of sources of supply or decreased capacities, land area available for development, available interconnections and other factors which may increase or reduce supply or demand per RCSA Sections 25-32d-3(b)(7) & (8). This worksheet will help the public water system calculate the margin of safety for the five, ten, twenty and fifty year planning periods. It is important that accurate and up to date safe yield data and accurate accounting of all system limitations are used to allow for proper planning of new sources to ensure a continuous pure and adequate supply to customers.

Instructions:
Provide the public water system (PWS) name, public water system identification number (PWSID), and primary town the water system is located. In the first column, inactive and emergency sources of supply must not be included since available water calculations only account for active sources of supply that meet the definition of RCSA Section 25-32d-1a(2). In the second column; Average Day Demand (ADD), Maximum Month Demand (MMD) and Peak Day Demand (PDD) should be expressed in gallons per day (GPD), and the Margin of Safety (MOS) for each type of water demand is calculated as a unitless ratio of available water to water demand.

The public water system owner or administrative contact is requested to sign, date and print their name certifying the information submitted for demonstration of margin of safety (MOS) is accurate to the best of their knowledge and was determined in accordance with the applicable Regulations of Connecticut State Agencies.

STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

DRINKING WATER SECTION

WORKSHEET FOR DEMONSTRATION OF MARGIN OF SAFETY (MOS)

Public Water System Name: **University of Connecticut - Main Campus**
PWSID: **#CT0780021**
Town(s): **Mansfield**

Available Water of all Active Sources & Interconnections (GPD) *Based on Worksheet for Demonstration of Available Water*	**Water Demand Based on Past 5 Years**					
	ADD	MOS	MMD	MOS	PDD	MOS
3,647,500.00	791,000.00	4.611251580278129	1,107,400.00	3.2937511287700922	1,819,300.00	2.0048919914252736

Available Water of all Active Sources & Interconnections (GPD) *Based on Worksheet for Demonstration of Available Water*	**Water Demand Projected for the next 5 Years**					
	ADD	MOS	MMD	MOS	PDD	MOS
3,647,500.00	929,000.00	3.926264800861141	1,301,000.00	2.8036126056879325	2,137,000.00	1.7068320074871315

Available Water of all Active Sources & Interconnections (GPD) *Based on Worksheet for Demonstration of Available Water*	**Water Demand Projected for the next 10 Years**					
	ADD	MOS	MMD	MOS	PDD	MOS
3,647,500.00	1,008,000.00	3.6185515873015874	1,411,000.00	2.585046066619419	2,318,000.00	1.5735547886108714

Available Water of all Active Sources & Interconnections (GPD) *Based on Worksheet for Demonstration of Available Water*	Water Demand Projected for the next 20 Years					
3,647,500.00	ADD	MOS	MMD	MOS	PDD	MOS
	1,166,000.00	3.1282161234991426	1,632,000.00	2.234987745098039	2,681,000.00	1.3604998135024244

Available Water of all Active Sources & Interconnections (GPD) *Based on Worksheet for Demonstration of Available Water*	Water Demand Projected for the next 50 Years					
3,647,500.00	ADD	MOS	MMD	MOS	PDD	MOS
	1,216,000.00	2.999588815789474	1,702,000.00	2.1430669800235016	2,796,000.00	1.3045422031473533

My signature below certifies that the information provided on this worksheet for demonstration of margin of safety (MOS) for the public water system indicated is accurate to the best of my knowledge and complies with the applicable Regulations of Connecticut State Agencies.

Stanley L. Nolan
Digitally signed by Stanley L. Nolan
DN: cn=Stanley L. Nolan, o=University of Connecticut, ou=Facilities Operations & Building Services, email=Stanley.Nolan@uconn.edu, c=US
Date: 2020.07.06 17:02:10 -04'00'

(Signature of public water system Owner or Administrative contact)

07/06/2020
(Date)

Stanley Nolan
(Print or type name)

APPENDIX I

Tank Inspection Reports

Water Storage Tank Inspection Report
Fenton Clearwell
CorrTech Report No. 12609-FOR-01

Prepared For:

Connecticut Water Company
93 West Main St
Clinton, CT 06413

Prepared By:

CorrTech, Inc.
25 South Street
Hopkinton, MA 01748
Job No. 12609

October 2017

STATEMENT OF LIMITATION

The conclusions presented in this document are based on the services described and not on tasks or procedures beyond the scope of the described procedures or the time and budgetary constraints imposed by the contract limitations.

CorrTech, Inc. has performed this assessment in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent consultants, and in accordance with the procedures established within CorrTech's quality assurance, quality control protocol.

CorrTech, Inc. shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld or not fully disclosed at the time the evaluation was performed.

Report Reviewed by: Ted Lund
Technical Director
NACE Certified Coating Inspector #050

TABLE OF CONTENTS

INTRODUCTION

On October 4th, 2017 CorrTech representatives, Bob Meskill and Ben Palmer performed a corrosion and structural assessment of the exterior and interior of the Connecticut Water Company Fenton clear well located in Mansfield, CT. The inspection was conducted to establish the current condition of the tank's coating and concrete substrate. The tank inspected included:

Fenton Clearwell

This work was completed under CorrTech Job No. 12609 and Connecticut Water Company PO NO. 31973 dated 7-31-17.

Tank inspection was performed in accordance with the latest version of CT DPH RCSA section 19-12 Water System Regulations, AWWA D101 53 (86R) standard for water tank inspections, the M42 AWWA Tank Guidance Manual.

The objectives of the assessment were to:

1. Perform field inspections and tests to assess the structural and coating integrity of the tank.
2. Review the safety compliance of tank ladders and access.
3. Review sanitary conditions and protection
4. Provide recommendations for rehabilitation.

EXECUTIVE SUMMARY

The condition and recommendations for the tank are briefly summarized in this section. For detailed information regarding detailed tank conditions and the specific recommendations please refer to the designated section for the tank.

Clear well was taken off line by the utility and was pressure washed to remove soft sediment and silt. After the inspection both chambers were disinfected in accordance with AWWA C652 Method 2 using a 200 ppm chlorine spray.

Clear well has a deep spalling location on the upper east wall of the East chamber which has root penetration. It is not clear if the roots are active. Spall location appears to correspond with an old overflow pipe location. In the West Chamber there is a small leak at the bottom of the south wall next to the outlet pipe. Above the leak there appears to be an older patch repair.

Both of the defects identified during the inspection need to be repaired and sealed from the inside and outside to prevent contamination.

OBSERVATIONS

Photos provided in the report were created from a digital camera. Interior images are as clear as our printed technology will allow. Photo copies in the report provide a reference for our comments.

Fenton Clearwell

Fenton Clear well is a poured in place concrete structure that measures 7-ft deep and is 30-ft by 30-ft with a concrete baffle separating the East and West chambers. Tank capacity is 46.000 gallons. There are two roof hatches into each chamber located at opposite ends of the chambers. Roof hatches measure 30-in by 30-in and are Bilco style that are equipped with interior rain curbs and screened drain tubes. Under the Bilco style hatches there ae 24-in round concrete risers to gain access to the tank. Hatches were locked prior to and after the inspection.

Fenton tank receives raw water from the wells which is subsequently treated prior to pumping into the distribution system. This clear well does not store finished drinking water.

INTERIOR

Roof (ceiling)

Roof is a self-supporting concrete pad with no visible cracking or spalling. Roof to shell seam has a black sealant material and no gaps, cracks or root penetration. A few pinpoint rust spots were observed which appear to be from the old rebar chairs used during construction.

Ladders

Cast iron ladder rungs are imbedded in the tank shell below each of the roof hatches. These ladder rungs are heavily corroded with extreme section loss which will not support as climber. There are some missing rungs.

Shell

Interior shell of the tank has a minor accumulation of clinging sediment staining. One area of spalling is on the upper east wall of the East Chamber. This area has been previously patched but the patch is failing and roots have penetrated the shell.

In the West chamber there is one crack that is allowing ground water to enter the tank The crack is located in the West Chamber on the southern wall to the right of the outlet pipe.

Floor

No cracking or spalling was observed on the floor of the tank. CorrTech removed a 1-in layer of sediment to conduct the inspection.

Inlet/ Outlet

There are separate inlet and outlet pipes. The inlet pipes are both located on the north ends of the chambers behind short weir walls. Outlet pipes are on the southern end of each chamber and have 6-in sediment curbs.

EXTERIOR

Roof

Roof is completely below grade.

Vent

A 6-in diameter snorkel vent pipe is located on the roof of each tank. There is an intact fine mesh screen on each vent and the opening is 27-in above the grass.

Overflow

There is no obvious overflow opening in the chamber walls. A small pipe stub is present down slope from the clear well which has been screened. The exterior pipe may correspond with the East Chamber spall area indicating that an old overflow pipe may have been sealed up.

Shell

Tank shell is below grade and could not be inspected.

RECOMMENDATIONS

Excavate the side of the East Chamber where the interior spalling is located. If a pipe is present remove and seal the location from the interior and exterior.

Excavate the south end of the West Chamber to expose the outlet pipe and bottom corner. Repair and seal the leaking location from the interior and exterior.

APPENDIX I
Photographs

CWC--Fenton Clearwell

DP#01
Tank area

DP#02
Soil covering tank

DP#03
Open roof hatches

DP#04
Roof hatch open with interior ladder

CWC--Fenton Clearwell

DP#05
Intact vent screening

DP#06
Vent pipes

DP#07
Level indicators

DP#08
Soil on tank roof

CWC--Fenton Clearwell


DP#09
Tank before cleaning


DP#10
Roof hatch and level indicator


DP#11
Inlet pipe with corrosion


DP#12
Screened overflow pipe

CWC--Fenton Clearwell

DP#13
Sediment ring on outlet

DP#14
Spalled area in shell

DP#15
Roots growing through spalled area

DP#16
Inlet pipe behind baffle

CWC--Fenton Clearwell


DP#17
ladder rungs and baffle


DP#18
Tank floor


DP#19
Leak near outlet pipe


DP#20
Lower shell and floor

CWC--Fenton Clearwell


DP#21
Upper shell and roof

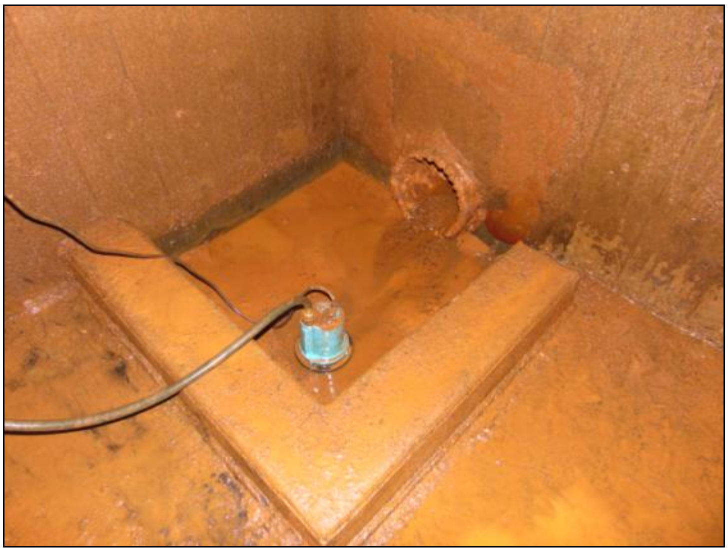

DP#22
Roof to shell seam


DP#23
Roof with no cracking or spalling


DP#24
Tank floor

CWC--Fenton Clearwell

DP#25
Floor and lower shell



DP#26
Sediment collar and outlet

DP#27
Alternate view of leak

CORROSION ENGINEERING
INFRASTRUCTURE TECHNOLOGIES

Water Storage Tank Report
CWC – UCONN Underground Reservoir
CorrTech Report No. 8130-3293

Prepared For:

Connecticut Water Company
2015 ROV Tank Inspections
93 West Main St.
Clinton, CT

Prepared By:

CorrTech, Inc.
25 South Street
Hopkinton, MA 01748

April 2015

TABLE OF CONTENTS

STATEMENT OF LIMITATION

The conclusions presented in this document are based on the services described and not on tasks or procedures beyond the scope of the described procedures or the time and budgetary constraints imposed by the contract limitations.

CorrTech, Inc. has performed this assessment in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent consultants, and in accordance with the procedures established within CorrTech's quality assurance, quality control protocol.

CorrTech, Inc. shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld or not fully disclosed at the time the evaluation was performed.

Report Prepared by: Ted Lund
NACE Certified Coating Inspector #0050
API-653 Certified Tank Inspector #714
April 2015

INTRODUCTION

On April 29th, 2015 CorrTech representatives, Garth Lund and Ben Palmer performed a corrosion and structural assessment of the interior of the UCONN underground reinforced concrete water storage tank for Connecticut Water Company. The inspection was conducted to establish the current condition of the tank's concrete roof and column construction. The tank inspected included:

5.4MG UCONN Underground Reservoir

The tank was inspected in accordance with the latest version of AWWA D101-53 (86R) standard for water tank inspections and CT DPH guidelines for disinfection.

The interior of the tank was inspected with the TankRover remotely operated vehicle, while full. The TankRover is the only piece of equipment like it in the United States and was developed by CorrTech. By using the TankRover the interior of the tank was inspected with no special preparation, no additional disinfection and no downtime.

The TankRover is equipped with a surface-cleaning tool used to remove loose rust or debris in order to view the potential substrate loss under the coating. The unit has high-powered thrusters, which are used to maneuver throughout the tank and are used to wash away bottom sediment for observations.

The TankRover was prepared for the inspection by disinfecting in accordance with AWWA C652-11 with 200-ppm chlorine solution.

The exterior portions of the tank are below grade and could not be inspected.

1. Perform field inspections and tests to assess the structural integrity of the tank.
2. Review the safety compliance of tank ladders and access.
3. Review sanitary conditions and protection
4. Formulate a report to document the assessment findings.
5. Provide recommendations for rehabilitation.

EXECUTIVE SUMMARY

The condition and recommendations for the reservoir are briefly summarized in this section. For detailed information regarding specific conditions and recommendations, please refer to the section so designated.

The tank shows very little change since the 2010 inspection. Roof cracking and spalling does not appear to have increased and the sediment depth is still less than uniform and less than ¼-inch.

The cast iron sluice gates are covered with thick corrosion products which is typical.
The tank should be inspected in 5-years.

OBSERVATIONS

Interior and exterior photos provided in the report were developed from a digital camera and were captured in digital format from the interior videotape. The interior images are as clear as our printing technology will allow. The interior video-snaps in the report provide a reference for our comments. Keep in mind that the videotape provides the greatest detail and should be viewed as part of the report. Each video-snap (VS) is marked with the time stamp from the videotape. This allows the reader to easily view the original footage for each feature.

Narration on the videotape is done in the field and some of the comments may be different than the written report.

5.4MG UCONN Underground Reservoir

The reservoir is located on the UCONN campus. The tank is a poured in place steel reinforced concrete structure with internal roof support structures and columns. The roof deck consists of pre-fabricated panels and structural ribs. The roof deck panels are supported by concrete rafters on square concrete columns.

The tank is separated into three chambers an east and west chamber each with separate inlet pipes and overflows. The outlet chamber is accessed through sluice gates in each chamber. The outlet pipes are located in this chamber.

The last inspection was conducted in 2010.

INTERIOR

The chambers of the tank were accessed through three Bilco style aluminum roof hatches. The hatches measure 49-in by 51-in. Each hatch has a 24-in sanitary lip and a 2-in hatch cover overlap. All three hatches were locked at the time of the inspection.

Roof (ceiling)

The roof is supported by square concrete columns. There were minor areas of spalling along the roof panel edges but there was no evidence of rebar corrosion. Efflorescence was observed in areas of spalling and cracking.

Columns

The columns had no major cracking or spalling visible and no separation from the floor or roof rafters.

Ladders

There are interior ladder rungs located under each of the three roof hatches. The rungs are embedded into the concrete walls. Ladder rungs had no significant section loss.

Shell

The shell has areas of delamination in the liner of the shell. This has occurred over 30% of the interior shell of the tank. Efflorescence had formed near areas of delamination due to spalling and cracking in those areas.

Floor

The floor is coated in sediment less than a ¼- inch of 70% of the tank floor. The exposed floor appeared to be in good condition with no significant cracking or spalling.

Inlet/Outlet& Overflow

The tank is equipped with an inlet pipe in the east and west chambers. The inlet pipe enters through the upper wall and had minor corrosion.

The outlet pipes are located in the final chamber behind the sluice gates.

The east and west chambers each have an overflow. The overflow runs from and interior funnel and discharges outside the tank onto trap rock. Both overflows are equipped with intact screening. The overflows had a diameter of 16-in.

Sluice Gates

The two cast iron sluice gates are heavily corroded with some brackets being completed corroded. The corrosion appears to be caused by the reaction between the stainless steel lift rod and the cast iron gate and brackets. The sluice gates were not operated at the time of the inspection.

EXTERIOR

The tank is completely underground with some area of shell exposed near the pump hose. The roof is covered in black top and the sides are covered grass. The small exposed portion had minor surface cracking. Some spalling was caused near the roof edge where the fence is located due to wind damage. Banners placed on the fence allowed high winds to push the fence posts out of the concrete.

Vents

The tank was equipped with (4) vents. They are candy cane style pipes with the openings 32.5-in above the grade. The diameter of the vent pipes was 12-in. The vent pipes were fully screened with fine mess at the time of the inspection.

RECOMMENDATIONS

The tank chambers show very little change in conditions since the last inspection in 2010. The sediment accumulation is slow and is not covering the entire floor.

The sluice gates should be operated at least once per year to maintain their free movement.

The tank should be inspected again in 5-years as is the CWC standard.

Appendix I
Photographs

CWC- Uconn underground tank


DP#1
View of the tank berm from the east side


DP#2
Tank berm and vent in SW corner


DP#3
Overflow pipe


DP#4
Screened overflow pipe

CWC- Uconn underground tank

DP#5
Oveflow discharge area

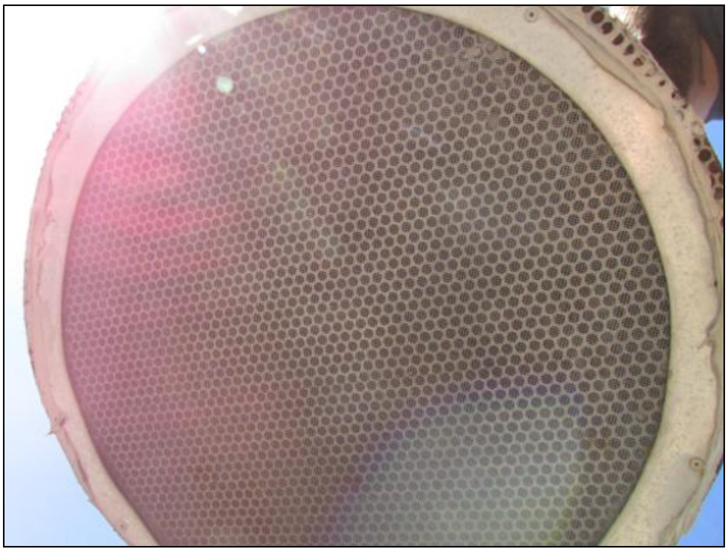
DP#6
West chamber oevrflow pipe

DP#7
Intact screen on the west chamber overflow

DP#8
Tank roof covered by asphalt

CWC- Uconn underground tank


DP#9
Vent one of four


DP#10
Intact vent screen


DP#11
Sluice gate control and roof hatch


DP#12
Roof vent and sluice gate controls

CWC- Uconn underground tank

DP#13
Locked roof hatch

DP#14
Sluice gate control near ashphalt

DP#15
Top of sluice gate controls

DP#16
Open roof hatch with interior ladder

CWC- Uconn underground tank


DP#17
Upper interior shell

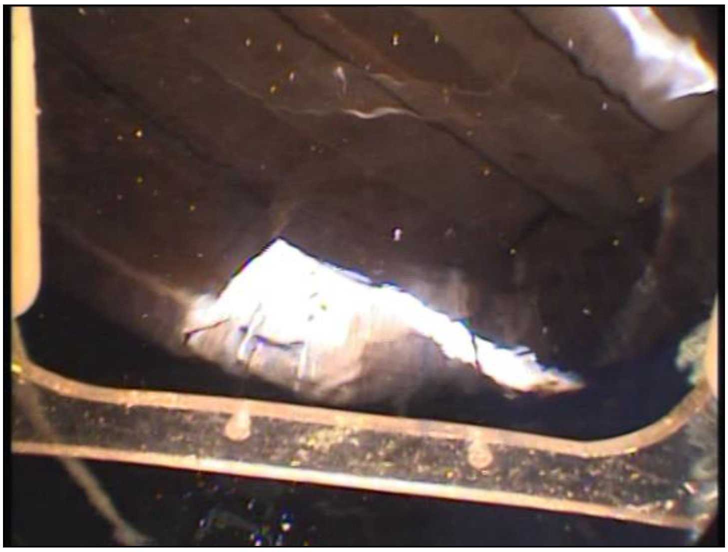

DP#18
Upper shell with efflorescence


DP#19
Roof beam with efflorescence on the underside


DP#20
Interior ladder

Underground Reservoir-East Chamber

0:12
Interior ladder

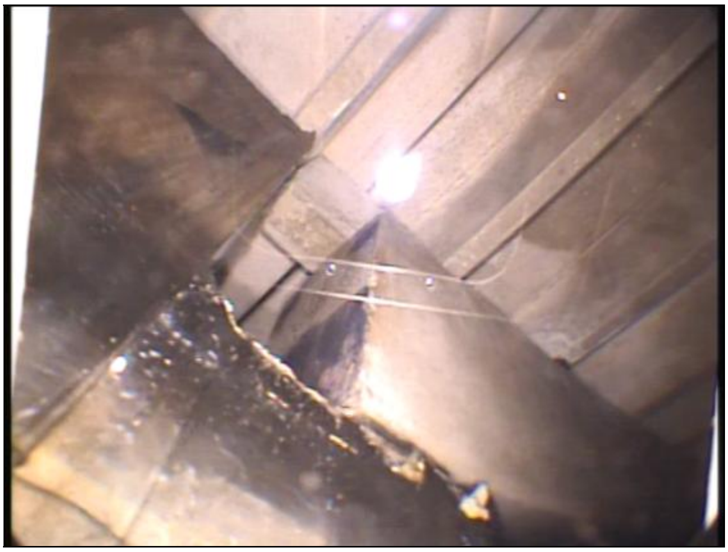


1:00
Roof hatch

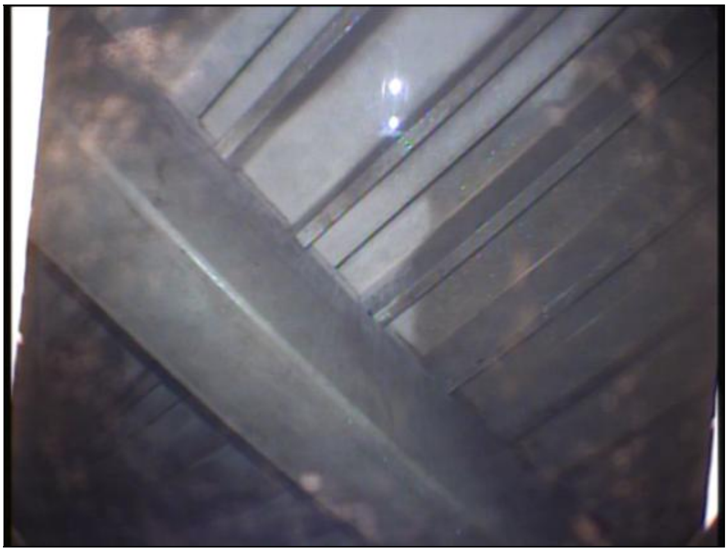
1:10
Roof support structures

1:17
Upper shell

Underground Reservoir-East Chamber


2:03
Opening to outlet chamber


2:36
Spalling in roof seam


4:41
Roof supporting rafter

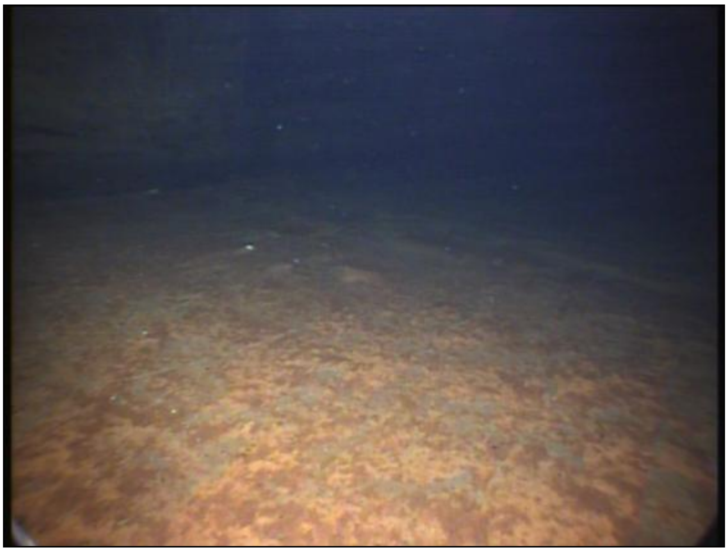

22:22
Inlet pipe

Underground Reservoir-East Chamber


26:53
Area of peeling liner

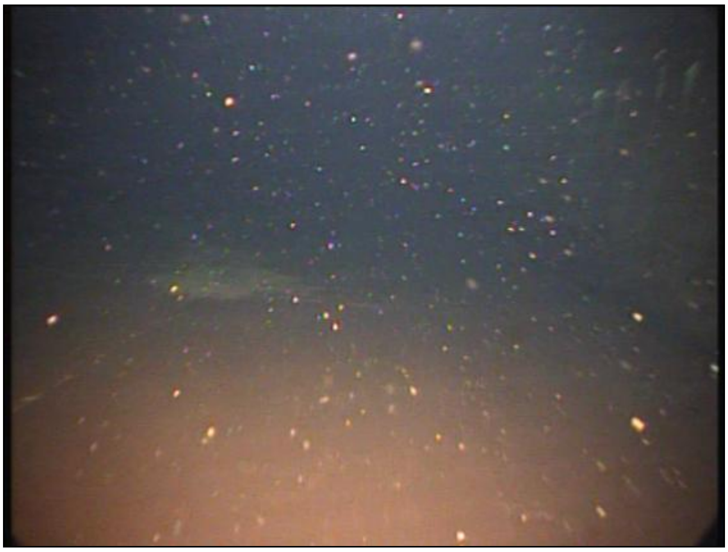

27:05
Peeling liner


32:57
Typical section of wall


36:49
Tank floor

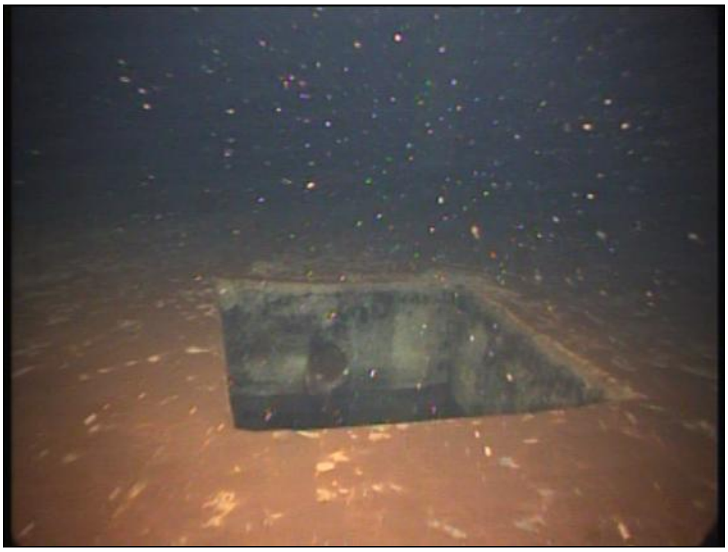
Underground Reservoir-East Chamber

45:06
Overflow pipe



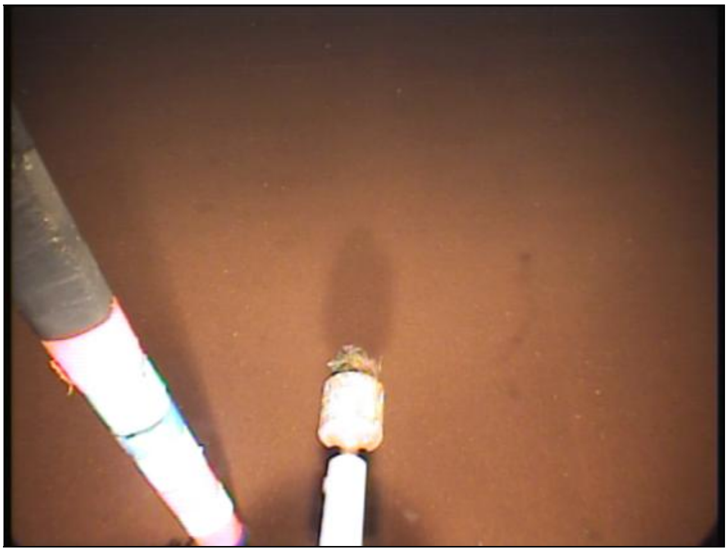
1:03:48
Floor sediment

1:26:13
Roof support column



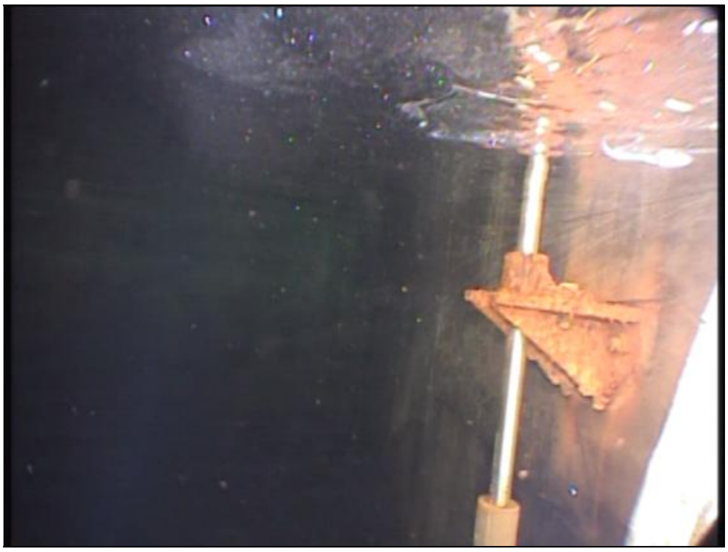
1:25:28
Floor sump

Underground Reservoir-East Chamber



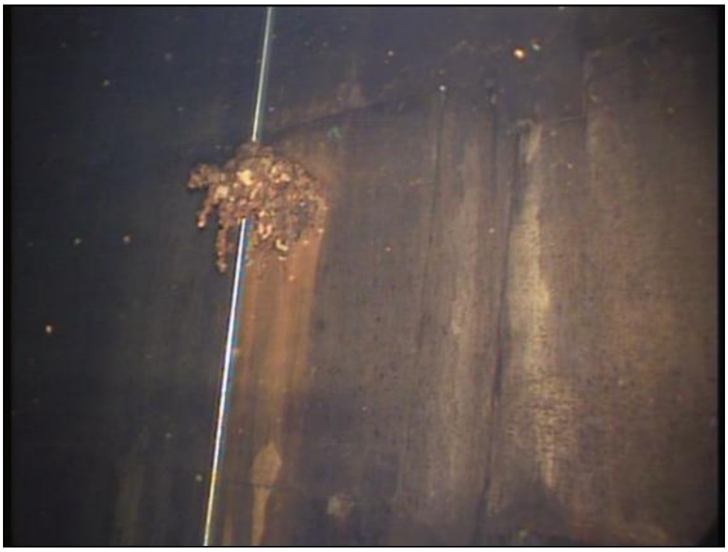
1:26:43
Sediment depth

Underground Reservoir - Outlet Chamber


0:10
Corroded gate bracket


0:28
Sluice gate lift rod

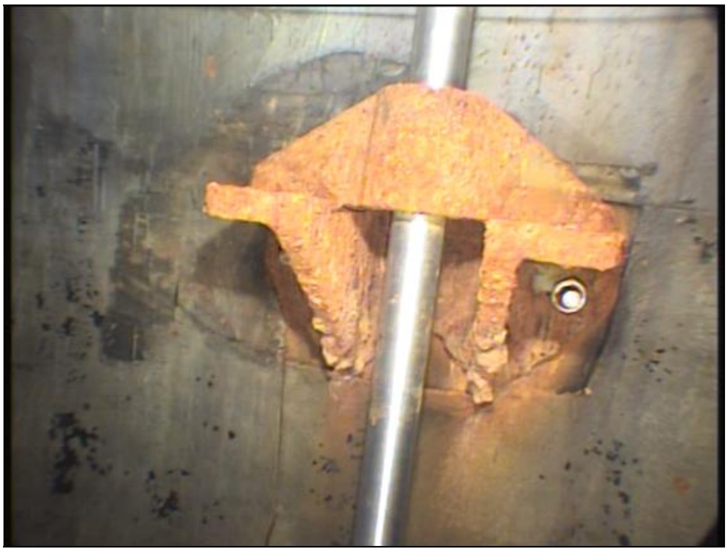

0:54
Roof and shell concrete


3:35
Corrosion on sluice gate bracket

Underground Reservoir - Outlet Chamber

4:03
Corroded sluice gate

4:33
Corroded sluice gate

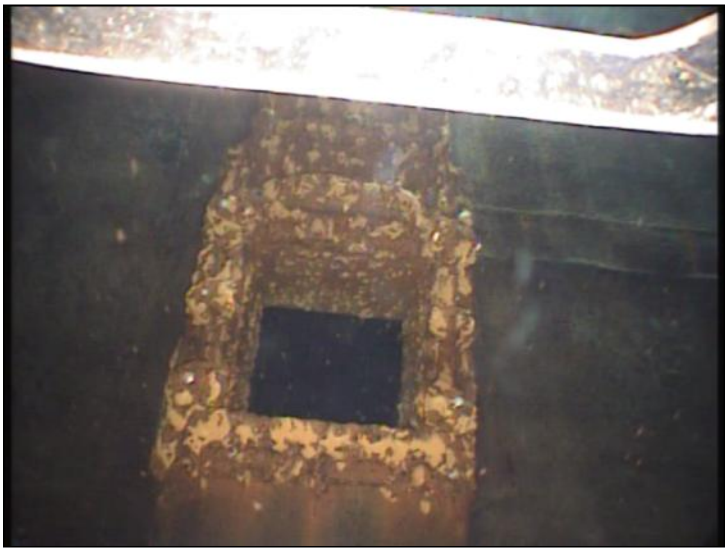


5:08
Sluice gate bracket

6:15
Outlet pipes

Underground Reservoir - Outlet Chamber


7:21
Shell efflorescence


9:50
Corroded sluice gate

Underground Reservoir- West Chamber

0:19
Interior ladder and roof hatch

0:34
Interior roof support structure

0:53
Roof support rafter

1:47
Overflow pipe

Underground Reservoir- West Chamber

5:32
Typical section of wall

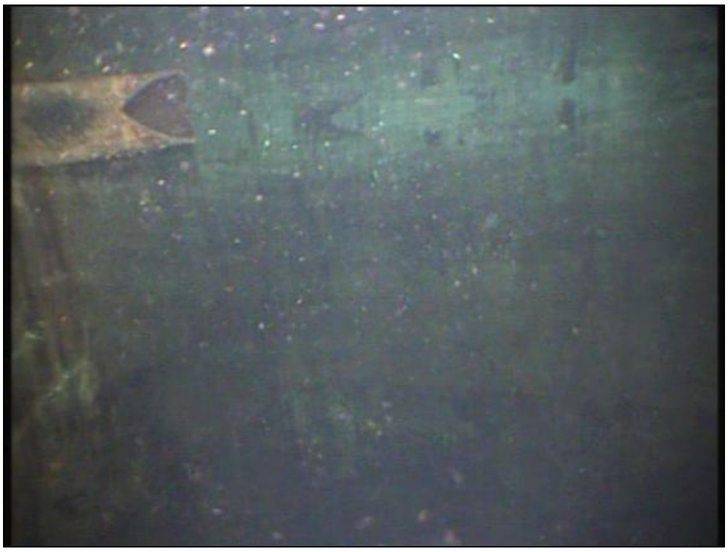
7:08
Sediment depth reading

7:47
Delaminating shell liner

11:26
Roof support column

Underground Reservoir- West Chamber

30:21
Sediment layer on floor



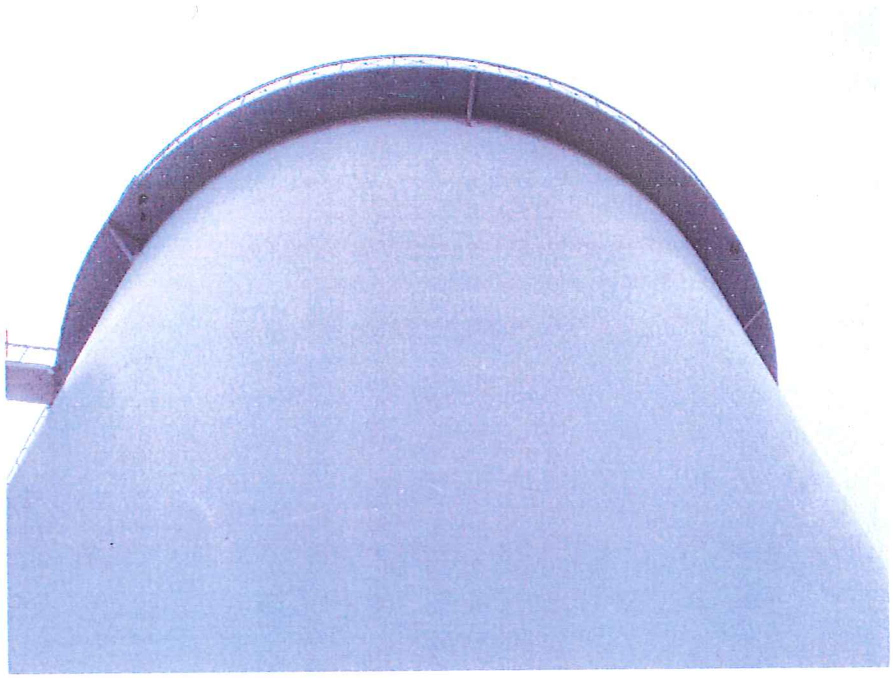
45:12
Inlet pipe

WATER TANK INSPECTION REPORT

For the

Connecticut Water Company

Of the



1.0MG UConn Standpipe
Storrs, CT

June 15, 2009

Extech, LLC

490 Industrial Park Road
Deep River, CT 06417
Tel: (860) 526-2610 Fax:(860) 526-5018)
www.extechllc.com

Table of Contents

Connecticut Water Company

UConn Standpipe

Storrs, CT

INTRODUCTION

On June 15, 2009 EXTECH representatives, Brian Klatzko and Robert Meskill performed corrosion and coating assessments of the exterior and interior of one steel water tank for The Connecticut Water Company at UCONN in Storrs, CT. This inspection was conducted to establish the current condition of the tank's coatings, substrate steel, and sediment depth.

- **UCONN 1.0MG Standpipe**

The tank was inspected in accordance with the latest version of AWWA D101 standard for water tank inspections, CT DPH Guidelines, as well as the new AWWA M42 Tank Manual.

The tank interior was inspected while full and in operation with the TankRover remotely operated vehicle. The TankRover is the only piece of equipment like it in the United States and was developed by Extech. By using the TankRover the tank was inspected with no special preparation, no additional disinfection, no confined space entry and no downtime.

The TankRover was prepared for the inspection by disinfecting in accordance with AWWA C652-02, by spray application of a 200-ppm chlorine solution prior to insertion of each tank.

The exterior portion of the tank was inspected by walking the roof, shell portions that were accessible from the balcony and vertical ladder, and portions that could be inspected from each tank's base. The objectives of the assessment were to:

1. Perform field inspections and tests to assess the structural and coating integrity of the tank
2. Review the safety compliance of tank ladders and access.
3. Determine if any interior coating damage was done during cellular antenna installation.
4. Formulate a report to document the assessment findings.
5. Provide recommendations for rehabilitation.

EXECUTIVE SUMMARY

The condition and recommendations for each tank are briefly summarized in this section. For detailed information regarding detailed tank conditions and the specific recommendations please refer to the designated section for each tank.

The tank appears to be in sound condition with regards to the steel shell, floor and roof. There is no evidence of significant metal loss or deep localized pitting.

The exterior coating is peeling at the interface between subsequent overcoats and the old paint.

The interior paint is failing on the plates, roof and weld seams. Interior corrosion is developing on the weld seams and producing pits.

The tank should be scheduled for an interior and exterior blast and repainting within the next 1-2 years to prevent major pitting on the interior.

In addition to the prevention of corrosion the tank should have the foundation repaired as well as upgrades to hatches, vents and the inlet pipe. Additional details are provided in the Recommendation section of this report.

OBSERVATIONS

Interior and exterior photographs provided in the report were developed from a digital camera and were captured in digital format from the interior videotape. The interior images are as clear as our printing technology will allow. The interior videosnaps in the report provide a reference for our comments. Keep in mind that the videotape provides the greatest detail and should be viewed as part of the report. Each Videosnap (VS) is marked with the time stamp from the videotape. This allows the reader to easily view the original footage for each feature.

A Posi-Tector 6000 was used to gather dry film thickness measurements on the exterior roof and shell surfaces.

Adhesion measurements were made using the ASTM 3359 A or B Method depending on coating thickness.

1.0MG Welded Standpipe UCONN

The year of construction was unknown because there is no tank plate. It is a welded steel standpipe that is approximately 85-ft tall and 45-ft in diameter.

The tank has a self-supporting dome roof with no interior support rafters or columns. The shell is constructed of 12-rings.

The overflow pipe terminates at the top ring and does not go to the ground.

The paint systems on the tank appear to be the following:

Interior- multi-coat vinyl
Exterior- Alkyd with at least one overcoat application

Interior

The interior of the tank was accessed through a 24-inch round roof hatch. The hatch has a 5-inch sanitary lip and a 2-inch hatch lip. See DP# 20. The hatch was locked at the time of the inspection.

Roof (ceiling)

The roof is dome shaped with a spider rod assembly to stabilize the top of the shell. The tension rods are corroding and have coating failure. See DP# 28, 31, 33. The roof plate

welds have backer bars on the interior that are corroding with minor metal loss. The roof plates are covered with surface rust and blisters. See DP# 29, 30, 32.

Shell

The interior coating is in fair to poor condition. There are blistering and corrosion cells along the weld seams and the shell wall. See VS# 3-7. Some corrosion cells were brushed with the ROV and have minor localized metal loss behind them. See VS# 8, 9. The corrosion cells and the blistering are common throughout the entire tank. The majority of the corrosion cells are along the horizontal weld seams. See VS# 10.

The ground hatch is visible on the bottom ring. There is corrosion along the edge of the hatch and the swing arm. See VS# 14.

Floor

The floor had a very light and thin material covering it. There is approximately 1/8 to ½-inch on the floor. See VS# 11. There are corrosion cells along the floor to shell seam and on the floor plates. See VS# 12, 13.

The inlet pipe comes from the bottom ring and angles up towards the roof. The outlet pipe is on the floor and has a sediment ring around it. See VS # 15, 16.

Ladders

There were no fixed interior ladders in the tank.

Cathodic Protection

There is no cathodic protection in the tank.

Exterior

Roof

The roof is in fair condition with moderate chalking. There are areas with the mid coat and the primer visible. There are also areas on the weld seams with coating failure down to the substrate and the steel is rusting. See DP# 21-25. There is no widespread corrosion and no significant metal loss on the exterior.

Dry film thickness readings were taken on the roof. There are 45 reading with a low reading of 10.7 mils, a high reading of 25.1 mils and with an average of 17.7 mils.

Vent

The roof has a center finial vent that has a 12"-inch collar. The distance from the vent cap to the roof is 11-inches. The screen is a steel, honeycomb screen that is secure and in good condition. See DP# 26, 27.

Ladders and Railings

The shell ladder is approximately 50-ft from the ground and is equipped with a safety cage. The entry point from the shell ladder to the balcony has a steel cover that is welded in place. See DP# 11, 13. The ladder from the balcony to the roof has rungs that are 12-inches apart with an 8-inch toe clearance and are 13-inches wide. See DP# 22. The ladder meets current OSHA requirements.

The railing system is in fair condition. There are many areas with paint delamination and primer visible. The floor of the balcony has areas of sitting water and is causing areas of corrosion. There is approximately 50% - 60% loss of paint on the railing system and the floor. The top rail is 36-inches tall with a 6-inch kick plate. See DP# 12, 14. The balcony rail does not meet current OSHA Fall Protection requirements.

Overflow Pipe

The overflow pipe terminates at the top ring and doesn't reach the ground. There is a coarse screen on the overflow that is secure and in tact. The overflow pipe is also equipped with a weir box. See DP# 18,19.

Shell

The shell coating has rock damage and mildew growing on the bottom ring. There is moderate chalking below and above the balcony. There are areas above the balcony that appear to be over-coated and have failed. See DP#1, 2, 16.

There were 45 dry film thickness reading taken on the ground. There is an average of 14.49 mils on the bottom shell with a high reading of 23.4 mils and a low reading of 8.6 mils.

There were 45 dry film thickness reading taken from the balcony floor as well. There is an average of 15.65 mils with a high reading of 29.5 mils and a low reading of .15 mils.

Foundation

The tank is sitting on a concrete foundation. The foundation is spalling throughout with deeply exposed aggregate. See DP# 2, 7. The chine plate that rests on the concrete foundation has paint delamination as well as metal loss in some areas. See DP # 4,5.

There are a total of 6 anchor chairs. The anchor bolts are 18-inch tall and 1.5-inch in width. The chair size is 12-inch tall and is 6-inchin width. They all enter into the concrete foundation. See DP# 6.

There is one ground hatch that is oval in shape. It is 24-inch in width and 18"-inch tall, see DP# 3.

RECOMMENDATIONS

Based on the condition of the tank, past metal loss, existing coating condition and metals content of the paint the following recommendations are made:

The interior and exterior should be blasted and repainted in the next 1-2 years. Although the exterior does not require painting from a corrosion standpoint it will be more cost effective to paint the entire tank under one contract.

When the tank is painted several upgrades are recommended to meet current OSHA and current industry practices;

The roof vent should be replaced with an AWWA Style vacuum/relief vent to allow for the use of a fine mesh bug screen.

The balcony rail should be extended to a total height of 42-inches to meet OSHA and a full mid rail should be installed.

When the tank is drained for painting a second ground hatch should be installed 30-inches in diameter.

Given the height of the tank consideration should be given to raising the inlet pipe 10-12 feet to provide better mixing of the tank.

The foundation should be sealed with a cement coat and then sealed against moisture intrusion with an epoxy coating.

The roof ladder should be equipped with a safety climb cable and/or handrail from the shell ladder to the vent.

Theodore W. Lewis

NACE Certified Coating Inspector #00050

GLOSSARY OF TERMS

Cathodic Protection - The use of a sacrificial metal or energized substance to polarize the structures surface and prevent corrosion.

Chalking - The degradation of a paint system when exposed to ultra-violet light which creates a loose residue on the surface.

Corrosion Cell - a concentrated localized site of accelerated corrosion that creates pitting.

Dry Film Thickness - Total thickness of a paint film when complete cured.

Finial Vent - The central roof vent on top of a water tank.

Holiday - a hole in a protective coating that may be invisible to the unaided eye that extends to the substrate.

Lead Abatement - The removal and a lead bearing paint system.

Lead Encapsulation - The covering over of a lead based paint by applying a compatible topcoat.

Osmotic Blister- Raised coating area created by build up of fluid under the coating. Fluid moves through coating in response to water/solvent concentrations between coating and tank water.

ROV- Remotely operated vehicle, underwater inspection device "TankRover"

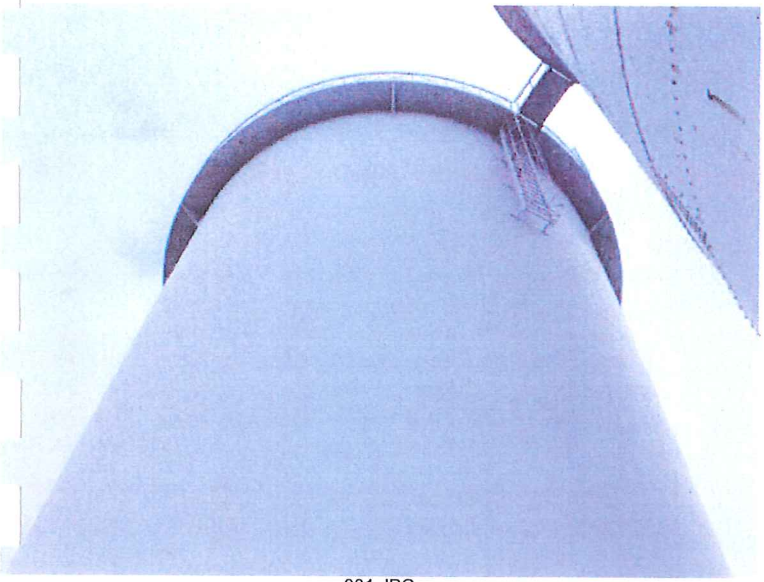
Silt - Material that accumulates in the bottom of a water tank originating from treatment by products and distribution system debris.

Tubercle- Domed shaped build up of corrosion products over an active corrosion site. Promotes metal loss through pitting due to differential oxygen concentrations.

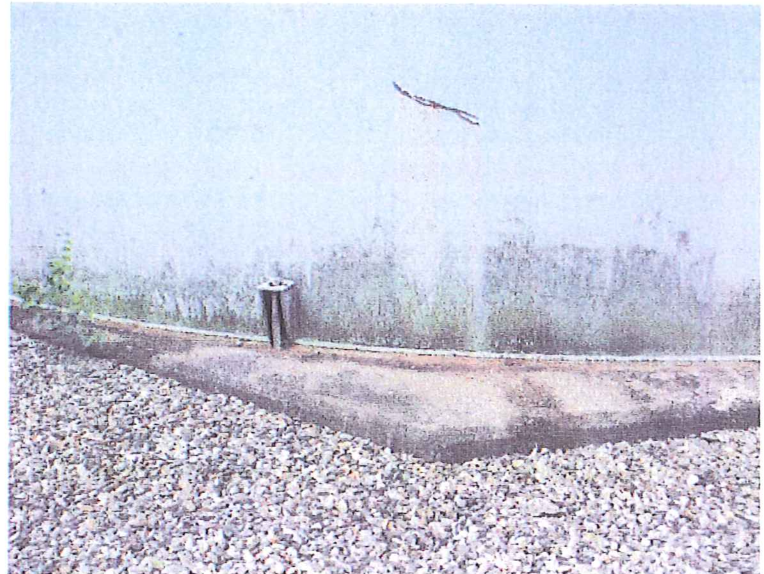
Ultrasonic Measurement - The use of high frequency sound waves passed through a material to measure the time required to return. The time required to pass through the material is correlated to the speed of sound in the substrate to yield an actual thickness at a specific location.

APPENDIX A

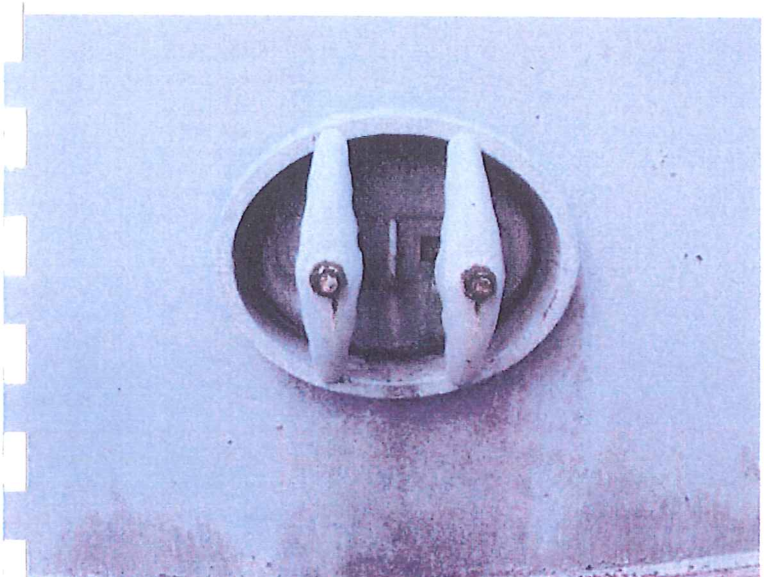
Digital Pictures
&
Video Snaps



001.JPG
06/14/2009
ınk overview. Ladder approx 50' off the ground and walkway to the stairway on the other t...



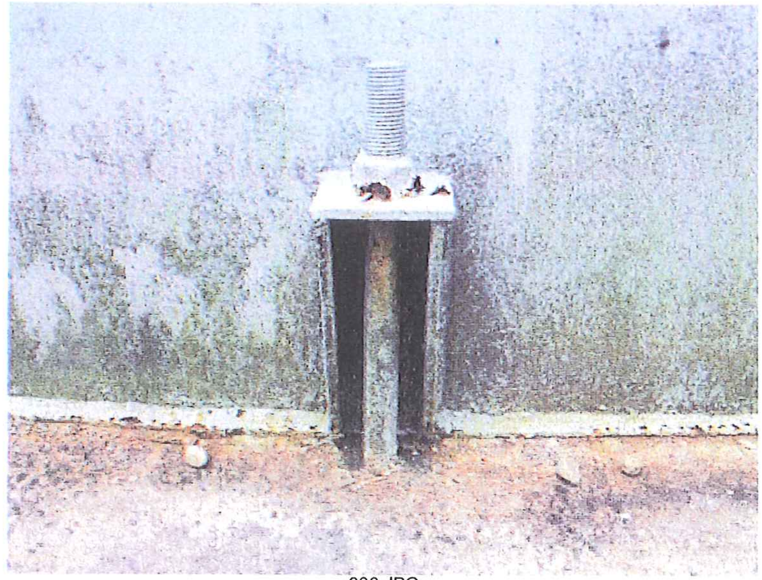
002.JPG
06/14/2009
Mildew on bottom ring - Concrete foundation in fair condition



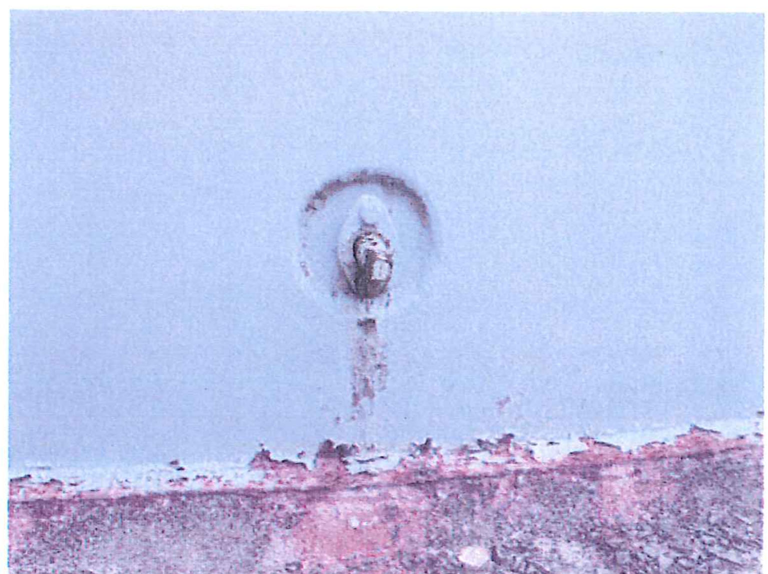
003.JPG
06/14/2009
Hatch is 24"W x 18"H. Corrosion on bolts holding the hatch in place.

004.JPG
06/14/2009
Corrosion on base plate and deterioration of concrete foundation.


005.JPG
06/14/2009
Corrosion and flaking on the base plate.


006.JPG
06/14/2009
Corrosion on anchor bolt and mildew on the exterior shell.


007.JPG
06/14/2009
Spalling of concrete foundation.

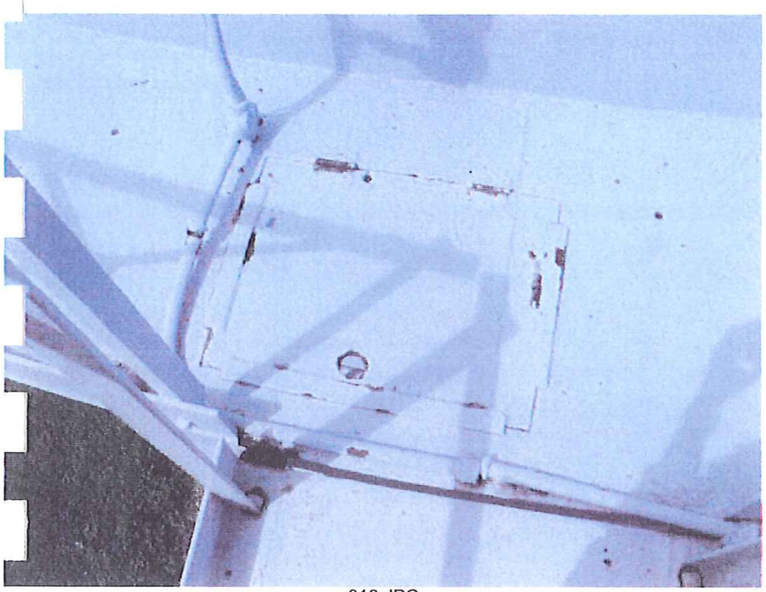

008.JPG
06/14/2009
Corrosion on old internal valve stem

009.JPG
06/14/2009
Gate 1 to stairwell is in poor condition

010.JPG
06/14/2009
Gate 2 to the stairwell works well.

011.JPG
06/14/2009
Manway to the tank from the middle tank. ladder is welded shut.

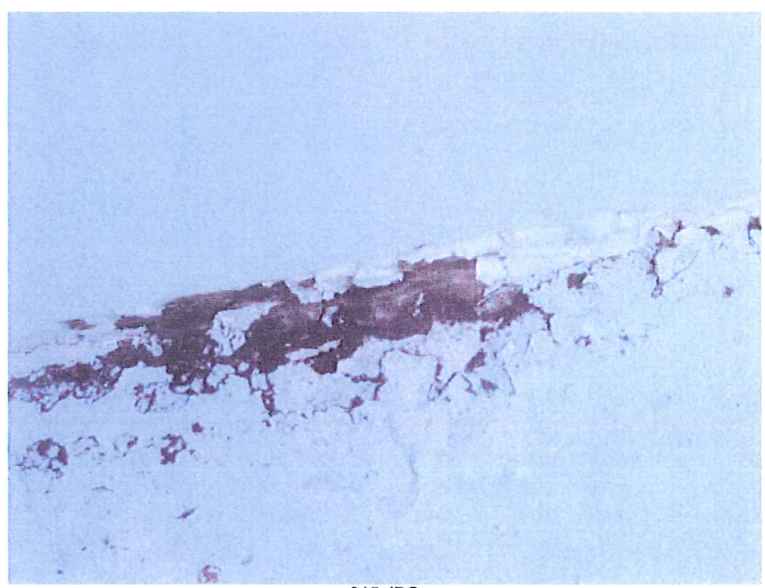
012.JPG
06/14/2009
Ladder to the roof is in good condition.



013.JPG
06/14/2009
For the ladder. Not used.

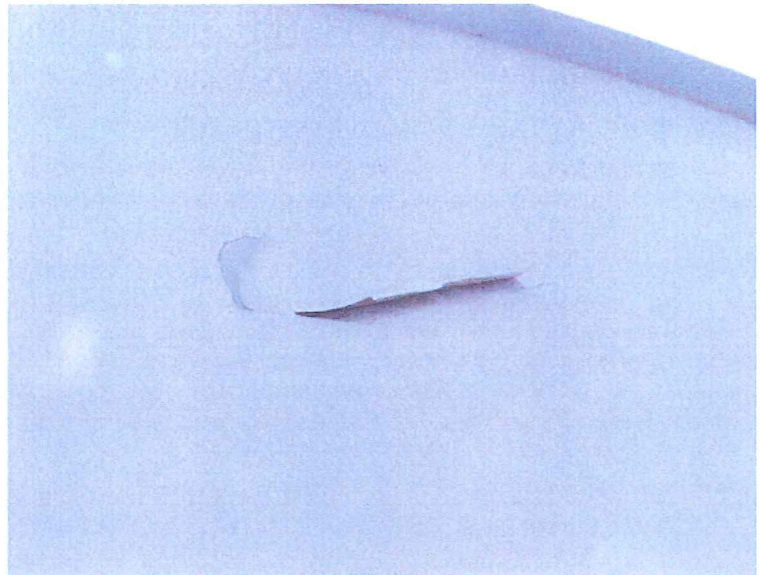
014.JPG
06/14/2009
Paint on balcony is flaking off.

014a.JPG
06/14/2009
Railing system - Coating failure and corrosion throughout the entire balcony

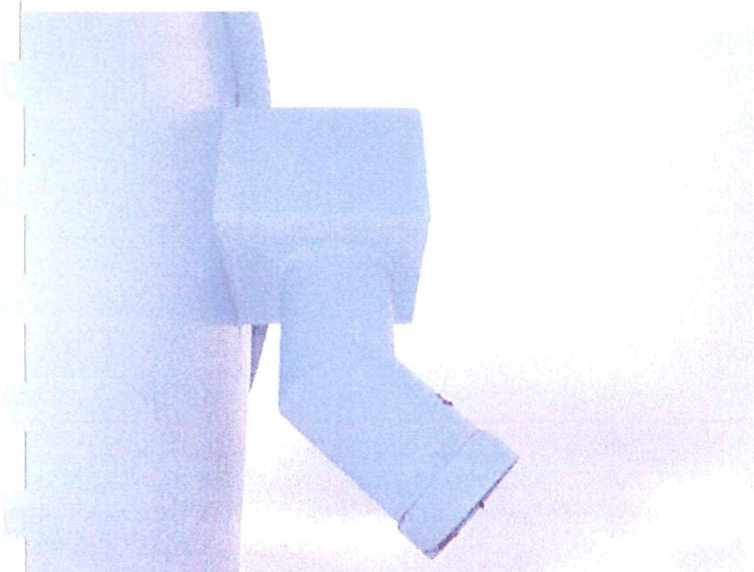


015.JPG
06/14/2009
Weld seam where paint has failed and steel is showing.

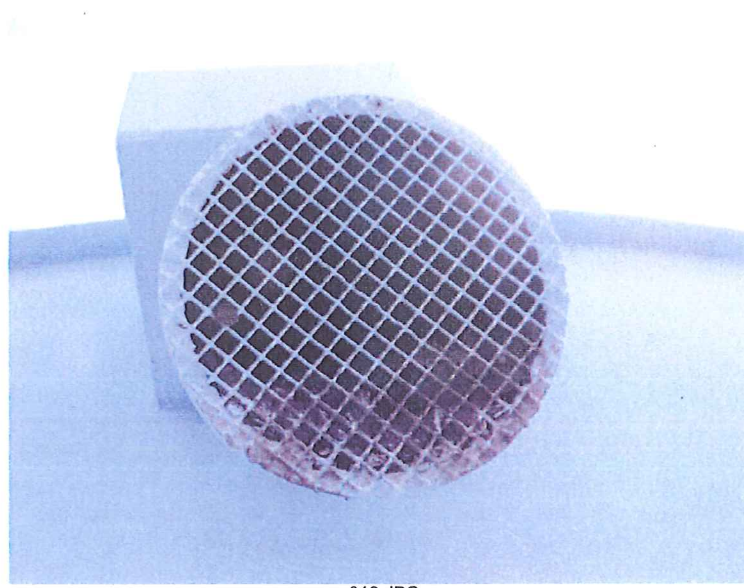
016.JPG
06/14/2009
Paint on shell wall is delaminating.



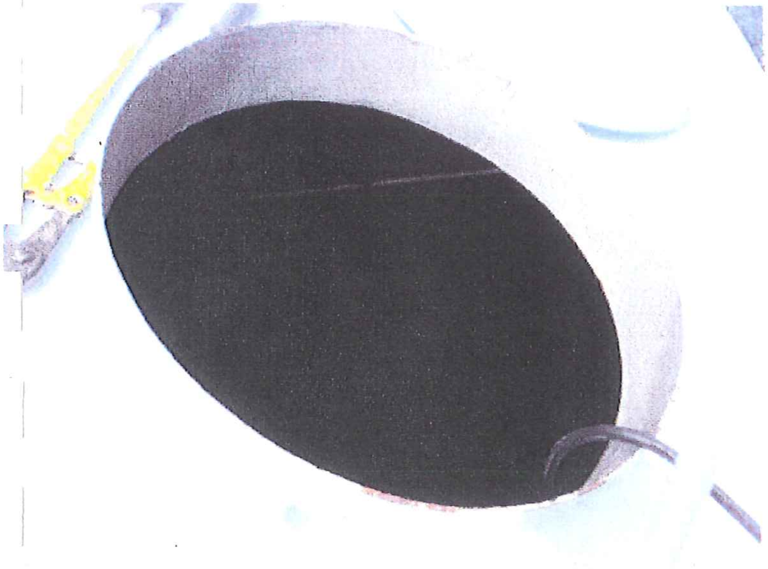
017.JPG
06/14/2009
Paint is delaminating.



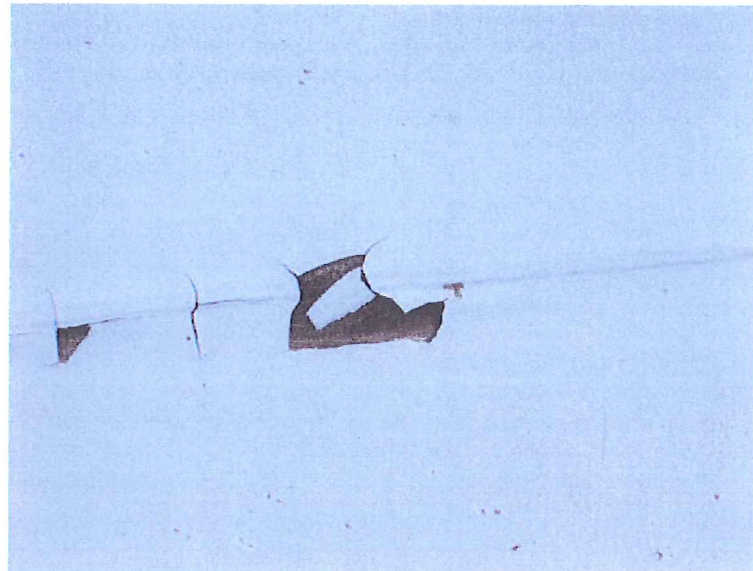
018.JPG
06/14/2009
Weirbox for the overflow pipe.



019.JPG
06/14/2009
Overflow screen in good condition.

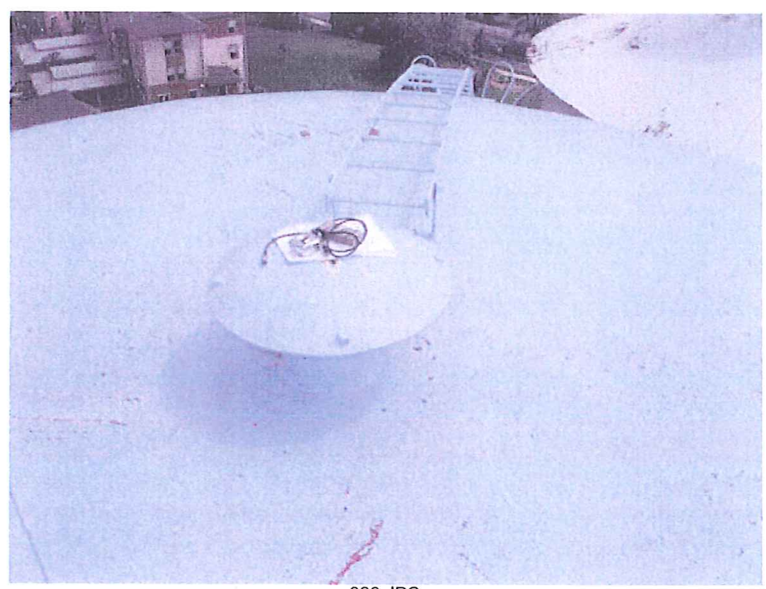


020.JPG
06/14/2009
Hatch, 24" dia, is in good condition.

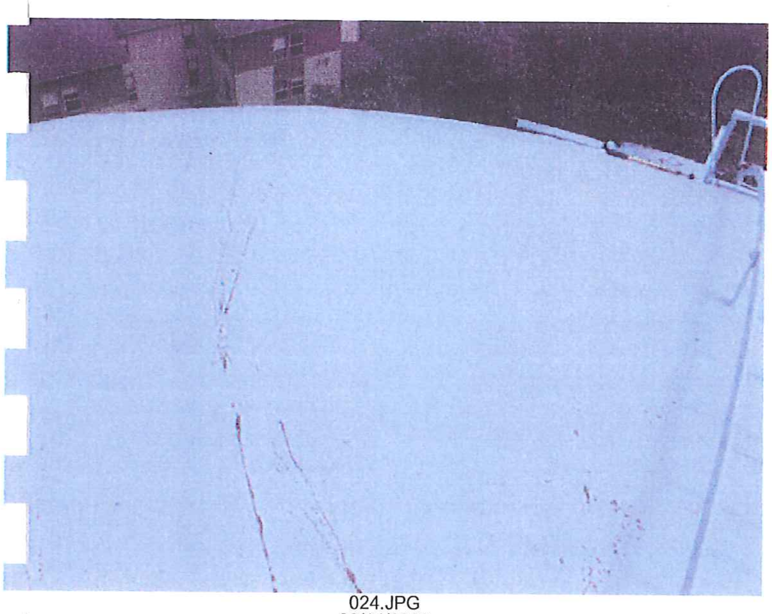


021.JPG
06/14/2009
Peeling of paint at weld seam.

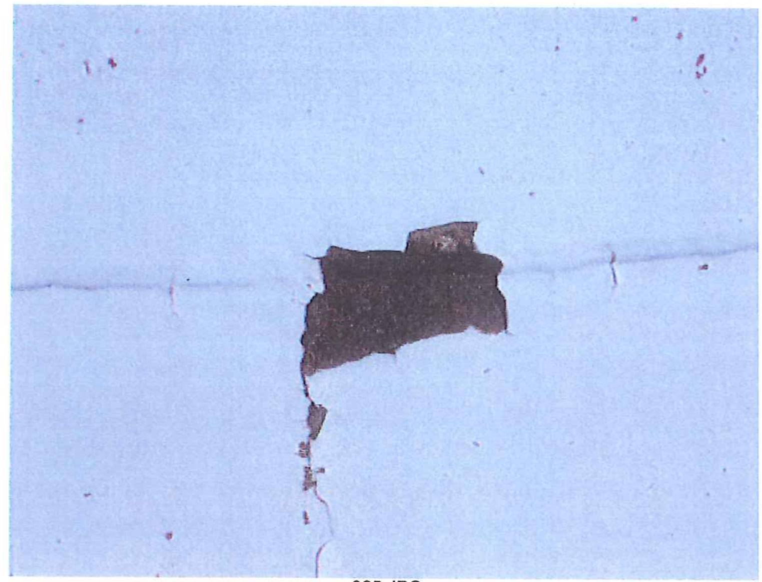
022.JPG
06/14/2009
Roof ladder system to vent. Notice corrosion spots on shell.



023.JPG
06/14/2009
Vent cap and view down the ladder.

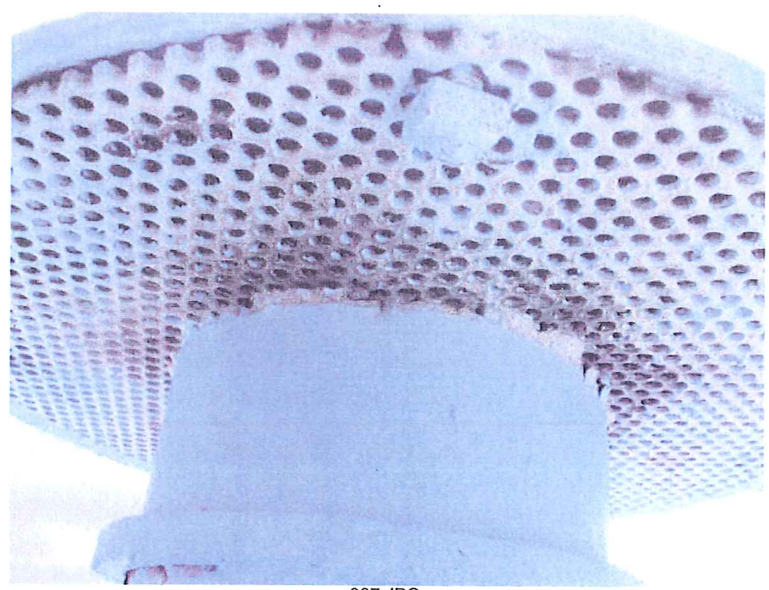


024.JPG
06/14/2009
Mid coat and primer visible with some surface rust



025.JPG
06/14/2009
Corrosion on weld seam on the exterior part of the roof.

026.JPG
06/14/2009
Vent collar is in good condition.

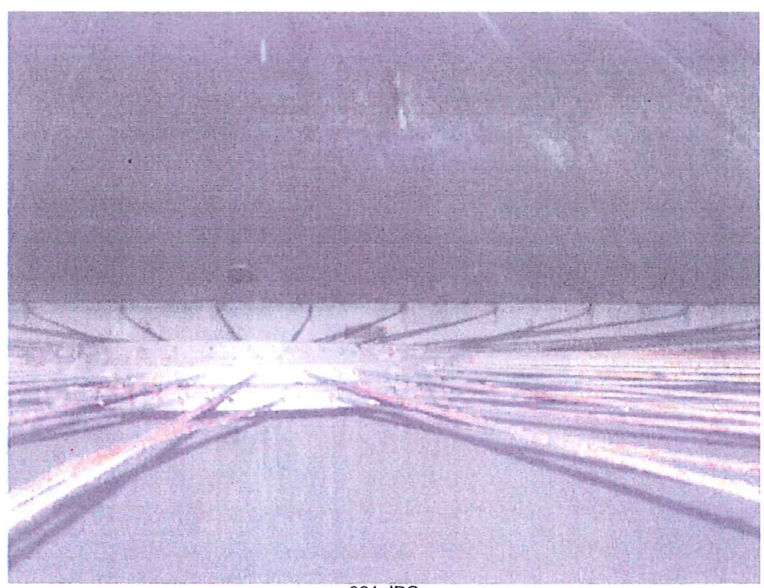


027.JPG
06/14/2009
Steel vent screen in good condition


028.JPG
06/14/2009
Tension rods corroding - Paint on roof flaking off

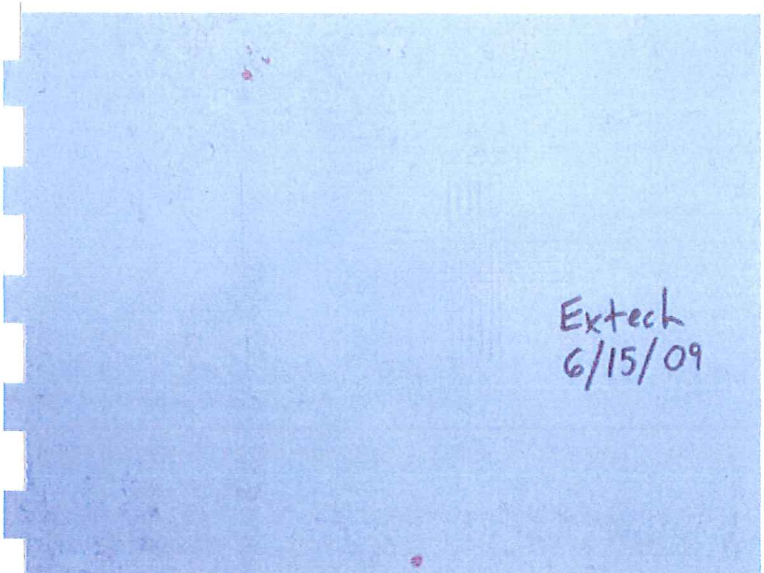

029.JPG
06/14/2009
Coating failure throughout the roof


030.JPG
06/14/2009
Roof corroding and paint flaking off


031.JPG
06/14/2009
Tension rods and the center hub

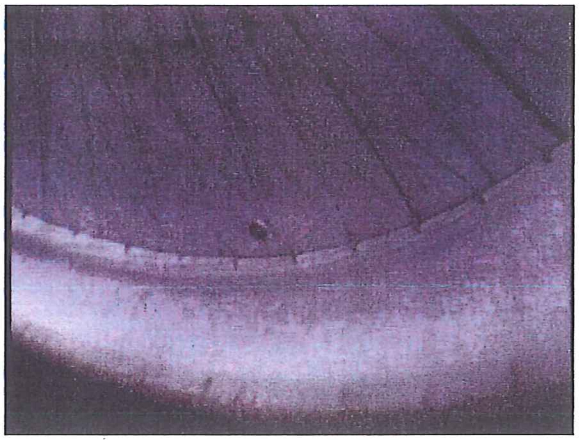
032.JPG
06/14/2009
Dollar plate with surface rust - Edge corrosion on roof weld seams

033.JPG
06/14/2009
Closeup of the paint failure on the tension rods

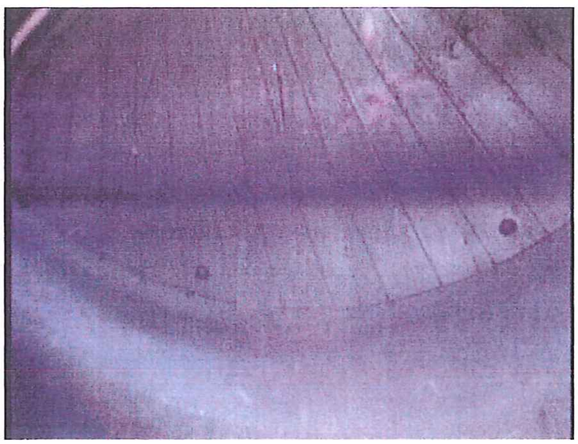


034.JPG
06/14/2009
Cross cut adhesion taken on the roof

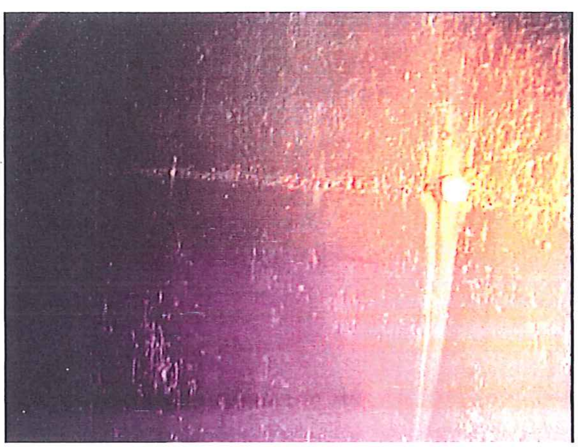
Connecticut Water Company | **UCONN Tank**



VS # 1: Tension rods with center hub; Tension rods are corroding (Time: 01:40)

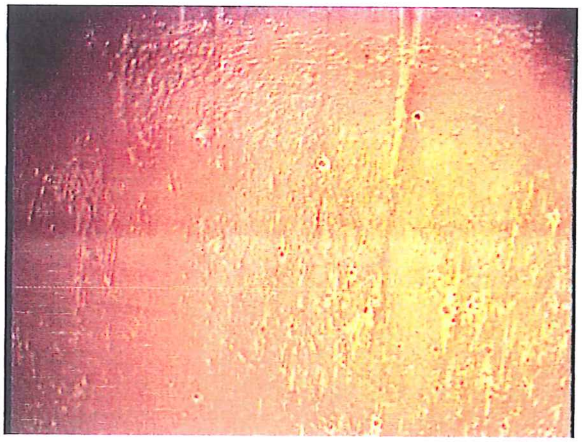


VS # 2: Roof plates with surface rust (Time: 02:36)



VS # 3: Dark iron staining on interior wall and blistering (Time: 05:12)

Connecticut Water Company **UCONN Tank**

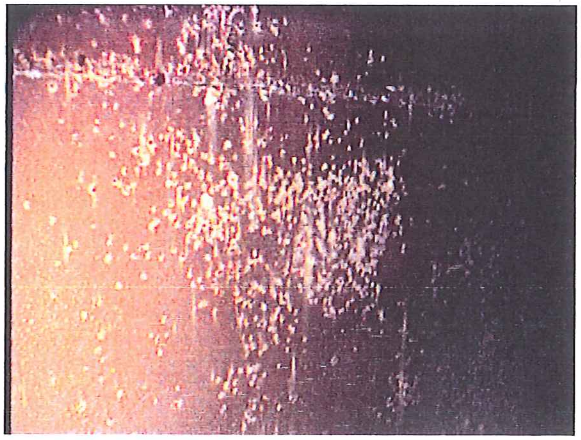


VS # 4: Areas with previous pitting on interior wall (Time: 05:21)

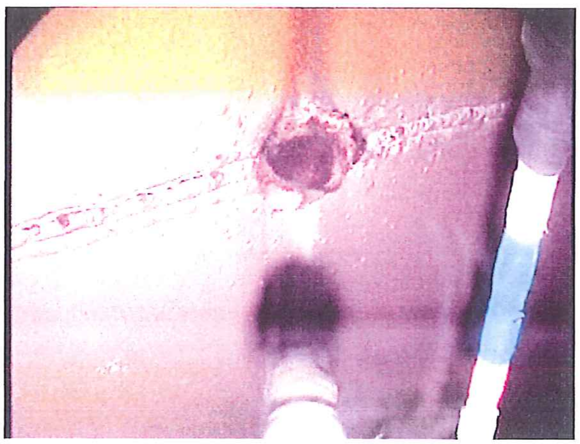
VS # 5: Corrosion cells on interior shell wall (Time: 06:44)

VS # 6: Corrosion cells along horizontal weld seam (Time: 08:18)

Connecticut Water Company | **UCONN Tank**



VS # 7: Blistering on interior wall (Time: 11:30)



VS # 8: Corrosion cell before being brushed (Time: 16:26)

VS # 9: Corrosion cell after being brushed (Time: 17:08)

Connecticut Water Company **UCONN Tank**

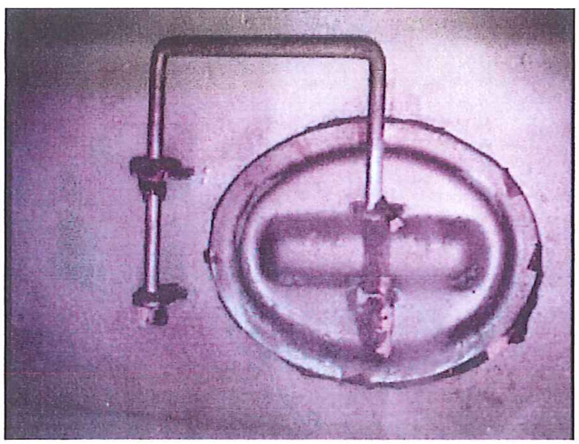
VS # 10: Big corrosion cells along horizontal weld seam (Time: 19:29)

VS # 11: 1/8" of sediment on tank floor (Time: 28:08)

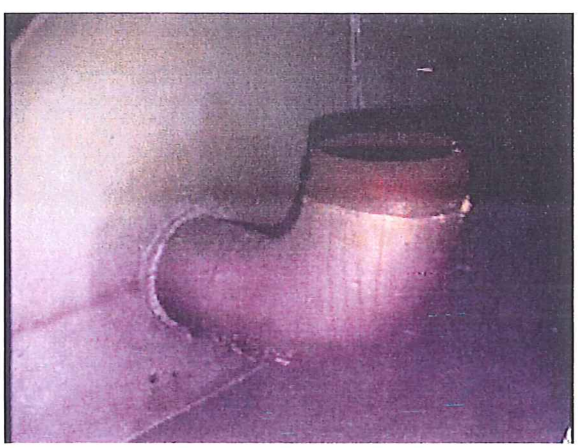
VS # 12: Blistering and corrosion on floor to shell seam (Time: 29:00)

Connecticut Water Company **UCONN Tank**

VS # 13: Corrosion cells on tank floor (Time: 29:27)



VS # 14: Oval ground hatch with a swing arm (Time: 30:10)



VS # 15: Inlet pipe (Time: 31:10)

Connecticut Water Company **UCONN Tank**

VS # 16: Outlet pipe (Time: 32:11)

APPENDIX B

Dry Film Thickness Readings

C.W.C Uconn Standpipe
D.F.T Readings

Batch 1 Shell

6000
S/N 56196

Batch1
Cal 2
2009/06/15
Probe Model: FS
Probe S/N: 37424

#	Reading	Time
1	16.8mils	09:49:16
2	18.2mils	09:49:19
3	16.5mils	09:49:22
4	17.3mils	09:49:25
5	14.0mils	09:49:28
6	12.6mils	09:49:31
7	18.4mils	09:49:42
8	9.7mils	09:49:44
9	10.7mils	09:49:47
10	14.5mils	09:49:49
11	14.8mils	09:49:52
12	13.0mils	09:49:55
13	23.4mils	09:49:58
14	10.2mils	09:50:01
15	16.8mils	09:50:04
16	19.5mils	09:50:08
17	9.8mils	09:50:11
18	10.4mils	09:50:15
19	11.6mils	09:50:23
20	12.7mils	09:50:25
21	9.5mils	09:50:28
22	11.6mils	09:50:31
23	9.9mils	09:50:33
24	11.3mils	09:50:36
25	8.6mils	09:50:39
26	11.6mils	09:50:41
27	13.9mils	09:50:44
28	12.7mils	09:50:47
29	17.7mils	09:50:50
30	17.8mils	09:50:53
31	15.8mils	09:50:55
32	15.9mils	09:50:57
33	19.3mils	09:50:59
34	15.5mils	09:51:01
35	20.6mils	09:51:25
36	12.4mils	09:51:27
37	16.4mils	09:51:29
38	12.2mils	09:51:31
39	18.2mils	09:51:35
40	15.5mils	09:51:37
41	17.7mils	09:51:39
42	14.0mils	09:51:41
43	20.0mils	09:51:44
44	12.1mils	09:51:46
45	17.7mils	09:51:48

#	45
↓	8.6mils
↑	23.4mils
$\bar{x}$	14.49mils
σ	3.48mils

Batch 2 Balcony

Batch2
Cal 2
2009/06/15
Probe Model: FS
Probe S/N: 37424

#	Reading	Time
1	17.9mils	10:51:41
2	18.4mils	10:51:43
3	15.6mils	10:51:45
4	12.6mils	10:51:47
5	14.9mils	10:51:50
6	19.6mils	10:51:52
7	15.2mils	10:51:54
8	15.8mils	10:51:56
9	13.7mils	10:51:58
10	16.1mils	10:52:01
11	16.5mils	10:52:03
12	12.5mils	10:52:06
13	19.1mils	10:52:09
14	15.1mils	10:52:11
15	14.1mils	10:52:14
16	14.9mils	10:52:17
17	17.5mils	10:52:20
18	14.5mils	10:52:22
19	15.6mils	10:52:26
20	17.1mils	10:52:28
21	11.6mils	10:52:31
22	15.9mils	10:52:34
23	17.0mils	10:52:38
24	17.0mils	10:52:40
25	20.6mils	10:52:43
26	15.3mils	10:52:46
27	20.0mils	10:52:50
28	19.7mils	10:52:53
29	3.2mils	10:52:58
30	0.15mils	10:53:02
31	29.5mils	10:53:04
32	1.85mils	10:53:07
33	1.75mils	10:53:09
34	21.1mils	10:53:11
35	21.2mils	10:53:14
36	20.0mils	10:53:17
37	21.3mils	10:53:21
38	19.0mils	10:53:24
39	16.1mils	10:53:36
40	18.1mils	10:53:39
41	22.9mils	10:53:42
42	12.1mils	10:53:46
43	13.3mils	10:54:01
44	15.6mils	10:54:04
45	13.5mils	10:54:07

#	45
↓	0.15mils
↑	29.5mils
$\bar{x}$	15.65mils
σ	5.50mils

Batch 3 Roof

Batch3
Cal 2
2009/06/15
Probe Model: FS
Probe S/N: 37424

#	Reading	Time
1	14.7mils	11:14:52
2	14.9mils	11:14:54
3	13.9mils	11:14:56
4	15.8mils	11:14:58
5	21.4mils	11:15:00
6	14.8mils	11:15:02
7	12.0mils	11:15:05
8	17.1mils	11:15:07
9	20.8mils	11:15:09
10	16.4mils	11:15:11
11	16.9mils	11:15:14
12	18.5mils	11:15:16
13	18.3mils	11:15:19
14	10.8mils	11:15:22
15	16.9mils	11:15:24
16	18.2mils	11:15:27
17	16.5mils	11:15:29
18	15.1mils	11:15:31
19	11.5mils	11:15:34
20	15.9mils	11:15:36
21	10.7mils	11:15:38
22	21.3mils	11:15:40
23	14.3mils	11:15:43
24	21.3mils	11:15:45
25	14.1mils	11:15:47
26	17.0mils	11:15:49
27	15.2mils	11:15:52
28	17.7mils	11:15:54
29	21.2mils	11:15:57
30	21.5mils	11:15:59
31	20.3mils	11:16:01
32	20.9mils	11:16:03
33	15.7mils	11:16:06
34	19.2mils	11:16:08
35	18.1mils	11:16:10
36	20.3mils	11:16:13
37	22.1mils	11:16:15
38	22.8mils	11:16:17
39	18.0mils	11:16:19
40	17.9mils	11:16:22
41	25.1mils	11:16:24
42	21.6mils	11:16:26
43	18.9mils	11:16:29
44	20.4mils	11:16:31
45	21.3mils	11:16:33

#	45
↓	10.7mils
↑	25.1mils
$\bar{x}$	17.72mils
σ	3.38mils

APPENDIX C
ASTM 3359 Adhesion Test Procedures

Standard Methods for MEASURING ADHESION BY TAPE TEST[1]

This standard is issued under the fixed designation D 3359; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

These methods have been approved for use by agencies of the Department of Defense and for listing in the DoD Index of Specifications and Standards.

1. Scope

1.1 These methods cover procedures for assessing the adhesion of coating films to metallic substrates by applying and removing pressure-sensitive tape over cuts made in the film.

1.2 Method A is primarily intended for use at job sites while Method B is more suitable for use in the laboratory. Also, Method B is not considered suitable for films thicker than 5 mils (125 μm).

1.3 These methods are used to establish whether the adhesion of a coating to a substrate is at a generally adequate level. They do not distinguish between higher levels of adhesion for which more sophisticated methods of measurement are required.

1.4 In multicoat systems adhesion failure may occur between coats so that the adhesion of the coating system to the substrate is not determined.

2. Applicable Documents

2.1 *ASTM Standards:*

D609 Methods for Preparation of Steel Panels for Testing Paint, Varnish, Lacquer, and Related Products[2]

D823 Methods of Producing Films of Uniform Thickness of Paint, Varnish, Lacquer, and Related Products on Test Panels[2]

D1730 Recommended Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting[2]

D2092 Practices for Preparation of Zinc-Coated Steel Surfaces for Painting[2]

D3330 Test Method for Peel Adhesion of Pressure-Sensitive Tape of 180° Angle[3]

3. Summary of Methods

3.1 *Method A*—An X-cut is made in the film to the substrate, pressure-sensitive tape is applied over the cut and then removed, and adhesion is assessed qualitatively on the 0 to 5 scale.

3.2 *Method B*—A lattice pattern with either six or eleven cuts in each direction is made in the film to the substrate, pressure-sensitive tape is applied over the lattice and then removed, and adhesion is evaluated by comparison with descriptions and illustrations.

METHOD A—X-CUT TAPE TEST

4. Apparatus and Materials

4.1 *Cutting Tool*—Sharp razor blade, scalpel, knife or other cutting devices. It is of particular importance that the cutting edges be in good condition.

4.2 *Cutting Guide*—Steel or other hard metal straightedge to ensure straight cuts.

4.3 *Tape*—One-inch (25-mm) wide semitransparent pressure-sensitive tape with an adhesion strength of 40 ± 2.5 oz/in. (44.6 ± 2.8 g/mm) width when tested in accordance with Test Method D 3330. The adhesion shall not change by more than ± 6.5 % of its mean value within 12 months. The backing of the tape may consist of fiber-reinforced cellulose acetate,[4] unplasti-

[1] These methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings and Materials and are the direct responsibility of Subcommittee D01.23 on Physical Properties of Applied Paint Films.

Current edition approved March 25, 1983. Published July 1983. Originally published as D 3359 – 74. Last previous edition D 3359 – 78.

[2] *Annual Book of ASTM Standards*, Vol 06.01.

[3] *Annual Book of ASTM Standards*, Vol 15.09.

[4] Permacel 99 manufactured by Permacel, New Brunswick, NJ 08903, is reported to be suitable for the purpose. The manufacturer of the tape used in the interlaboratory study[5] has advised that as of September 1981 the properties of this tape are being changed. Users of its should, therefore, check whether current material gives comparable results to previous supplies."

cized poly(vinyl chloride), or polyester film.

4.4 *Rubber Eraser*, on the end of a pencil.

4.5 *Illumination*—A light source is helpful in determining whether the cuts have been made through the film to the substrate.

5. Test Specimens

5.1 When this method is used in the field, the specimen is the coated structure or article on which the adhesion is to be evaluated.

5.2 For laboratory use apply the materials to be tested to panels of the composition and surface conditions on which it is desired to determine the adhesion.

NOTE 1—Applicable test panel description and surface preparation methods are given in: Method D 609, Recommended Practice D 1730, and Practice D 2092.

NOTE 2—Coatings should be applied in accordance with Methods D 823, or as agreed upon between the purchaser and the seller.

NOTE 3—If desired or specified, the coated test panels may be subjected to a preliminary exposure such as water immersion, salt spray, or high humidity before conducting the tape test. The conditions and time of exposure will be governed by ultimate coating use or shall be agreed upon between the purchaser and seller.

6. Procedure

6.1 Select an area free of blemishes and minor surface imperfections. For tests in the field, ensure that the surface is clean and dry. Extremes in temperature or relative humidity may affect the adhesion of the tape or the coating.

6.2 Make two cuts in the film each about 1.5 in. (40 mm) long that intersect near their middle with a smaller angle of between 30 and 45°. When making the incisions, use the straightedge and cut through the coating to the substrate in one steady motion.

6.3 Inspect the incisions for reflection of light from the metal substrate to establish that the coating film has been penetrated. If the substrate has not been reached make another X in a different location. Do not attempt to deepen a previous cut as this may affect adhesion along the incision.

6.4 Remove two complete laps of the pressure-sensitive tape from the roll and discard. Remove an additional length at a steady (that is, not jerked) rate and cut a piece about 3 in. (75 mm) long.

6.5 Place the center of the tape at the intersection of the cuts with the tape running in the same direction as the smaller angles. Smooth the tape into place by finger in the area of the incisions and then rub firmly with the eraser on the end of a pencil. The color under the transparent tape is a useful indication of when good contact has been made.

6.6 Within 90 ± 30 s of application, remove the tape by seizing the free end and pulling it off rapidly (not jerked) back upon itself at as close to an angle of 180° as possible.

6.7 Inspect the X-cut area for removal of coating from the substrate or previous coating and rate the adhesion in accordance with the following scale:

5A No peeling or removal
4A Trace peeling or removal along incisions
3A Jagged removal along incisions up to 1/16 in. (1.6 mm) on either side
2A Jagged removal along most of incisions up to 1/8 in. (3.2 mm) on either side
1A Removal from most of the area of the X under the tape
0A Removal beyond the area of the X

6.8 Repeat the test in two other locations on each test panel. For large structures make sufficient tests to ensure that the adhesion evaluation is representative of the whole surface.

6.9 After making several cuts examine the cutting edge and, if necessary, remove any flat spots or wire-edge by abrading lightly on a fine oil stone before using again. Discard cutting tools that develop nicks or other defects that tear the film.

7. Report

7.1 Report the number of tests, their mean and range, and for coating systems, where the failure occurred that is, between first coat and substrate, between first and second coat, etc.

7.2 For field tests report the structure or article tested, the location and the environmental conditions at the time of testing.

7.3 For test panels report the substrate employed, the type of coating, the method of cure, and the environmental conditions at the time of testing.

8. Precision

8.1 In an interlaboratory study[5] of this method in which operators in six laboratories made one adhesion measurement on three panels each of three coatings covering a wide range of adhesion, the within-laboratories standard deviation was found to be 0.33 and the between-

[5] The report on which this precision statement is based has been filed at ASTM Headquarters, 1916 Race St., Philadelphia, Pa. 19103, as RR: D01-1008.

laboratories 0.44. Based on these standard deviations, the following criteria should be used for judging the acceptability of results at the 95 % confidence level:

8.1.1 *Repeatability*—Provided adhesion is uniform over a large surface, results obtained by the same operator should be considered suspect if they differ by more than 1 rating unit for two measurements.

8.1.2 *Reproducibility*—Two results, each the mean of triplicates, obtained by different operators should be considered suspect if they differ by more than 1.5 rating units.

METHOD B—CROSS-CUT TAPE TEST

9. Apparatus and Materials

9.1 *Cutting Tool*—Sharp razor blade, scalpel, knife or other cutting device having a cutting edge angle between 15 and 30° that will make either a single cut or several cuts at once. It is of particular importance that the cutting edge be in good condition.

9.2 *Cutting Guide*—If cuts are made manually (as opposed to a mechanical apparatus) a steel or other hard metal straightedge or template to ensure straight cuts.

9.3 *Rule*—Tempered steel rule graduated in 0.5 mm for measuring individual cuts.

9.4 *Tape*, as described in 4.3.

9.5 *Rubber Eraser* on the end of a pencil.

9.6 *Illumination*, as described in 4.5.

9.7 *Magnifying Glass*—An illuminated magnifier to be used while making individual cuts and examining the test area.

10. Test Specimens

10.1 As described in Section 5.

11. Procedure

11.1 Where required or when agreed upon, subject the specimens to a preliminary test before conducting the tape test (see Note 3). After drying or testing, select an area free of blemishes and minor surface imperfections.

11.2 Place the panel on a firm base and under the illuminated magnifier make parallel cuts as follows:

11.2.1 For coatings having a dry film thickness up to and including 2.0 mils (50 μm) space the cuts 1 mm apart and make eleven cuts unless otherwise agreed upon.

11.2.2 For coatings having a dry film thickness between 2.0 mils (50 μm) and 5 mils (125 μm), space the cuts 2 mm apart and make six cuts. For films thicker than 5 mils use Method A.

11.2.3 Make all cuts about ¾ in. (20 mm) long. Cut through the film to the substrate in one steady motion using just sufficient pressure on the cutting tool to have the cutting edge reach the substrate. When making successive single cuts with the aid of a guide, place the guide on the uncut area.

11.3 After making the required cuts brush the film lightly with a soft brush or tissue to remove any detached flakes or ribbons of coatings.

11.4 Examine the cutting edge and, if necessary, remove any flat spots or wire-edge by abrading lightly on a fine oil stone. Make the additional number of cuts at 90° to and centered on the original cuts.

11.5 Brush the area as before and inspect the incisions for reflection of light from the substrate. If the metal has not been reached make another grid in a different location.

11.6 Remove two complete laps of tape and discard. Remove an additional length at a steady (that is, not jerked) rate and cut a piece about 3 in. (75 mm) long.

11.7 Place the center of the tape over the grid and in the area of the grid smooth into place by a finger. To ensure good contact with the film rub the tape firmly with the eraser on the end of a pencil. The color under the tape is a useful indiction of when good contact has been made.

11.8 Within 90 ± 30 s of application, remove the tape by seizing the free end and rapidly (not jerked) pulling it off at as close to an angle of 180° as possible.

11.9 Inspect the grid area for removal of coating from the substrate or from a previous coating using the illuminated magnifier. Rate the adhesion in accordance with the following scale illustrated in Fig. 1:

5B The edges of the cuts are completely smooth; none of the squares of the lattice is detached.
4B Small flakes of the coating are detached at intersections; less than 5 % of the area is affected.
3B Small flakes of the coating are detached along edges and at intersections of cuts. The area affected is 5 to 15 % of the lattice.
2B The coating has flaked along the edges and on parts of the squares. The area affected is 15 to 35 % of the lattice.
1B The coating has flaked along the edges of cuts in large ribbons and whole squares have detached. The area affected is 35 to 65 % of the lattice.
0B Flaking and detachment worse than Grade 1.

Classification of Adhesion Test Results

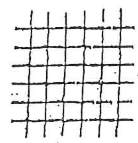
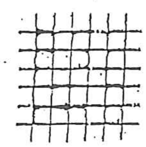
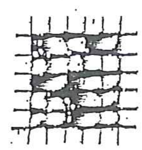
Classification	Surface of cross-cut area from which flaking has occurred. (Example for six parallel cuts)
5B	None
4B	
3B	
2B	
1B	
0B	Greater than 65%

FIG. 1 Classification of Adhesion Test Results

Water Tank Inspection Report

For

Connecticut Water Company

Of the

UConn Standpipe #2

March 13, 2012

ACUREN

455 Main Street Bldg 1 Suite A-B
Deep River, CT 06417
Tel: (860) 526-2610 Fax:(860) 526-5018)
www.extechllc.com

Table of Contents

Connecticut Water Company
Clinton, Ct.

INTRODUCTION

On March 13, 2012 Acuren Inspection representatives, Matt Weaver and Ben Palmer performed a corrosion and one year coating assessment of the exterior and interior of a potable water storage tank for The Connecticut Water Company located in Storrs, CT. The inspection was conducted to establish the current condition of the tank's coatings and steel substrate. The tank inspected included:

1.0 MG Tank #2 Standpipe UCONN

The tank was inspected in accordance with the latest version of AWWA D101-53 (86R) standard for water tank inspections, the M42 AWWA Tank Guidance Manual and CT DPH guidelines.

The interior of the standpipe was inspected with the TankRover remotely operated vehicle, while full. The TankRover is the only piece of equipment like it in the United States and was developed by Acuren. By using the TankRover the interior of the tank was inspected with no special preparation, no additional disinfection and no downtime.

The TankRover is equipped with a surface-cleaning tool used to remove loose rust or debris in order to view the potential metal loss under the coating. The unit has high-powered thrusters, which are used to maneuver throughout the tank and are used to wash away bottom sediment for observations.

The TankRover was prepared for the inspection by disinfecting in accordance with AWWA C652 with 200-ppm chlorine solution.

The exterior portions of the tank was inspected by walking the roof and shell portions that were accessible from the vertical ladder, and portions that could be inspected from tank's base.
The objectives of the assessment were to;

1. Perform field inspections and tests to assess the structural and coating integrity of the tank.
2. Review the safety compliance of tank ladders and access.
3. Review sanitary conditions and protection
4. Provide recommendations for rehabilitation.
5. Formulate a report to document the assessment findings.

EXECUTIVE SUMMARY

The conditions and recommendations for the tank are briefly summarized in this section. For detailed information regarding tank conditions and the specific recommendations please refer to the designated section for each tank.

Based on the condition of the interior and exterior coatings we have no recommendations for coating repairs at this point.

The tank is in good condition and meets current OSHA safety requirements.

The interior roof coating is in good condition and near 100% intact. The interior shell below the water line has two to three pinpoint corrosion cells on the weld seams. Dry spray on the shell is present but no blistering. On the audio portion of the inspection video the operator erroneously characterizes dry spray adhering to the shell as blistering.

There is minor corrosion on the brackets for the inlet pipe stands.

The exterior coatings are in good condition with no failure locations.

The current ladder guard for the shell ladder is not attached and is resting on the overflow splash pad. The anti climb provides additional tank security.

Based on the tank's current condition it should be re-inspected in 2017 according to AWWA recommendations and current industry practice.

OBSERVATIONS

Photographs provided in the report were created from a digital camera and interior pictures were captured in digital format from the interior videotape. The interior images are as clear as our printed technology will allow. The copies in the report provide a reference for our comments. Keep in mind that for underwater video snaps, the videotape provides the greatest detail and should be viewed as part of the report.

A Posi-Tector 6000 was used to gather dry film thickness measurements on the exterior roof and shell surfaces.

1.0 MG UCONN Standpipe

The standpipe is a welded steel structure approximately 45 feet in diameter, 85 feet high and 1.0 MG. The access man way used at the time of inspection was locked.

INTERIOR

The interior of the tank was accessed through the hatch near the shell ladder. The tank is equipped with three roof hatches that are 30-inches square, with an 8-inch sanitary lip and a 2-inch hatch lip, which exceeds minimum sanitary requirements, see DP# 25, 26, 30, 31. The water level during the inspection was approximately 16 feet below the manway. The utility contact onsite was Paul Radichi.

Roof (ceiling)

The roof is a self-supported high domed structure with lap-welded steel plates. The roof coating is in good overall condition and nearly 100 percent intact see DP# 32-37. All welds and connections look to be in good condition. The roof to shell seam shows no evidence of corrosion.

Ladders

There is no interior ladder in the tank.

Shell

The shell coating is in good condition with almost no active corrosion cells found on the shell plates and welded seams. Two small pinpoint corrosion cells were observed on a horizontal weld but this is minimal, see VS# 6. Areas of clinging dry spray were observed on the shell but no major areas of corrosion are present at this time, see VS 2-6. The floor to shell seam appears to be in good condition with no active corrosion visible.

Floor

There is a very thin, light layer of sediment accumulation that covers the floor about 1/8-inch deep or less, see VS# 9, 12, 13. No major areas of coating delamination or blistering were observed on the floor.

Inlet/ Outlet

The tank has a separate inlet and outlet pipe. The inlet pipe extends from the floor to the other side of the tank and is supported by angle iron brackets. The inlet pipe faces upwards to increase water circulation. The pipe is clamped and bolted to the angle iron support brackets, see VS# 8, 9, 10, 12, 13.

The outlet pipe is located next to the inlet pipe along the perimeter on the floor. The outlet pipe appears to be a 12-inch opening with an 8-inch sediment lip, see VS# 11.

<u>*EXTERIOR*</u>

Roof

The exterior roof coating was in good overall condition with no significant areas of corrosion and still retains its original gloss see DP# 25, 27.

A total of 45 dry film thickness readings were taken on the exterior roof using a Positector 6000. The low reading of 6.2 mils, a high reading of 23.9 mils and an average reading of 14.6 mils. These readings show no significant coating thinning has occurred.

Vent

The tank is equipped with a central, domed vent. The vent pipe and cap are in good condition with no corrosion, see DP# 28. The vent is equipped with a coarse style screen that is in tact, see DP# 29. The vent measures 14-inches in diameter and the vent cap extends 23-inches above the roof plates.

Ladders and Railings

The shell ladder is in good condition with the first rung cut 8-feet off the ground. The ladder is equipped with a safety cage located at the top shell course, and a rail climb, see DP# 9-11. The ladder dimensions are 16-inches in width, 12-inches rung-to-rung and a 10-inch toe kick. The ladder was equipped with an anti climb but the anti climb is currently not installed and is on the overflow splash pad, see DP# 12.

The roof platform and walkway are all in good condition and are compliant with current OSHA fall prevention requirements see DP# 23-25. The roof perimeter railing measures 42-inches high, with a 21-inch mid rail and a 4-inch toe kick, see DP# 23-25.

Shell

The shell coating is in good overall condition and still retains its original gloss see DP# 1. Minor mildew staining was found on the lower shell. There are three ground man way hatches that measure 36-inches in diameter, see DP# 4, 5.

A total of 45 dry film thickness readings were taken on the exterior shell using a Positector 6000. There is a high reading of 17.4 mils, a low reading of 6.3 mils and an average of 10.1 mils.

Overflow

The overflow consists of an exterior weir box and external steel 12-inch diameter-piping see DP# 11, 16. The overflow discharge point is equipped with a mesh and coarse screen, see DP# 14. The overflow discharges to a concrete splash pad that is surrounded by rip rap, see DP# 13, 15.

Foundation

The tank rests on a concrete ring wall that is in good overall condition. One area of spalling was observed on the edge of the ring wall, see DP#18. The chime plate to foundation seam is sealed with a flexible grout that is in good condition.

There is a total of 30 anchor bolts that measure 28-inches high and 2 inches in diameter. All of the anchor chairs are in good condition and the anchor nuts appear to be tight and secure, see DP# 7, 8.

RECOMMENDATIONS

<u>UCONN 1.0 MG Standpipe Tank #2</u>

There are no recommendations for coating repair at this time.

The exterior shell ladder guard should be installed.

The tank should be inspected again in 2017 according to AWWA recommendations and current industry practice.

Theodore W. Lewis

NACE Certified Inspector #0050

GLOSSARY OF TERMS

Cathodic Protection - The use of a sacrificial metal or energized substance to polarize the structures surfaces and prevents corrosion.

Chalking - The degradation of a paint system when exposed to ultra-violet light, which creates a loose residue on the surface.

Corrosion Cell - concentrated localized site of accelerated corrosion that creates pitting.

Dry Film Thickness - Total thickness of a paint film when completely cured.

Finial Vent - The central roof vent on top of a water tank.

Holiday - hole in a protective coating that may be invisible to the unaided eye that extends to the substrate.

Lead Abatement - The removal of a lead bearing paint system.

Lead Encapsulation - The covering over of a lead based paint by applying a compatible topcoat.

Osmotic Blister- Raised coating area created by build up of fluid under the coating. Fluid moves through coating in response to water/solvent concentrations between coating and tank water.

ROV- Remotely operated vehicle, underwater inspection device "TankRover"

Silt - Material that accumulates in the bottom of a water tank originating from treatment by products and distribution system debris.

Tubercle- Domed shaped build up of corrosion products over an active corrosion site. Promotes metal loss through pitting due to differential oxygen concentrations.

Ultrasonic Measurement - The use of high frequency sound waves passed through a material to measure the time required to return. The time required to pass through the material is correlated to the speed of sound in the substrate to yield an actual thickness at a specific location.

Appendix A

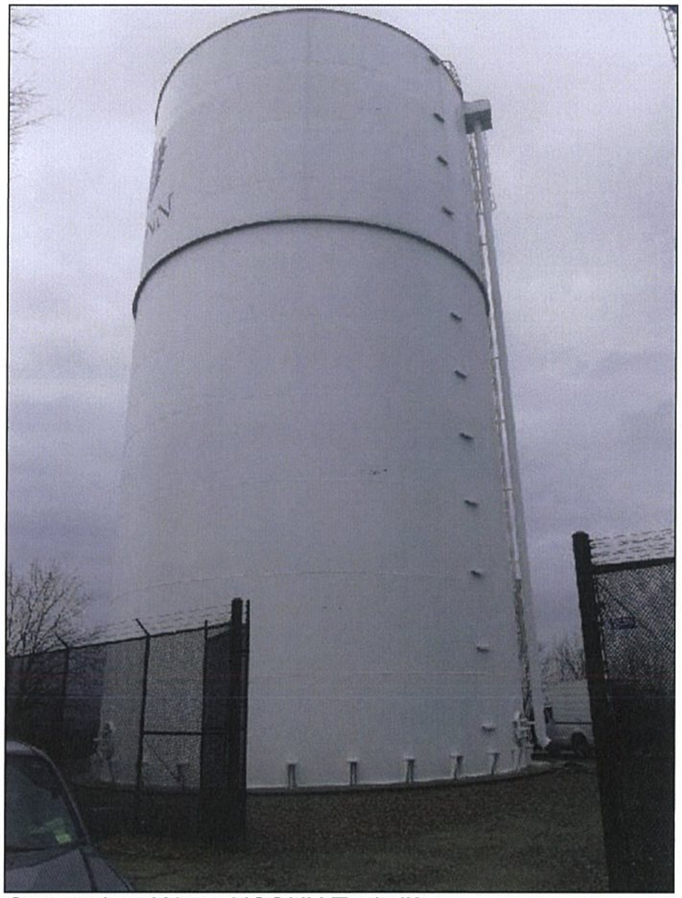
Photographs

Connecticut Water Company

UCONN Standpipe Tank #2

Connecticut Water UCONN Tank #2

DP#1



Connecticut Water UCONN Tank #2

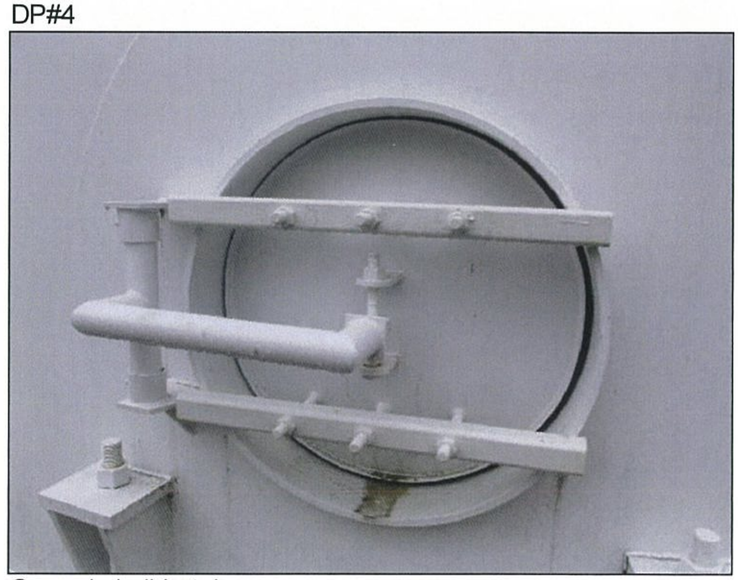
DP#2

Exterior upper shell

DP#3

Exterior upper shell

DP#4



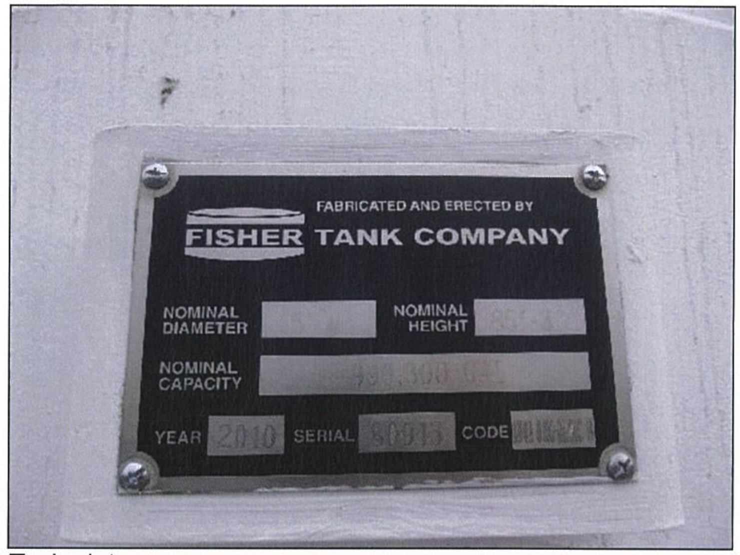
Ground shell hatch

Connecticut Water UCONN Tank #2

DP#5

Second ground hatch

DP#6



Tank plate

DP#7

Concrte foundation and anchor bolts

DP#8

Anchor chair and bolt

Connecticut Water UCONN Tank #2

DP#9

Shell ladder

DP#10

Ladder rail climb

DP#11

Shell ladder and overflow pipe

DP#12

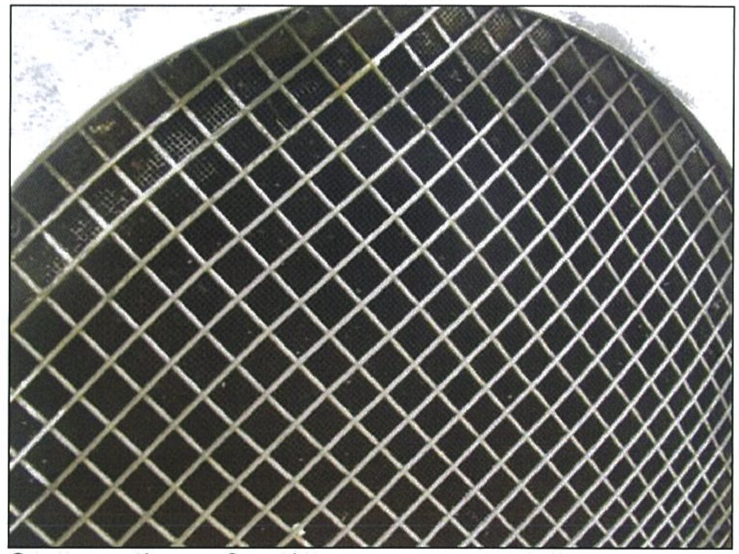
Anti climb not attached to the shell ladder

Connecticut Water UCONN Tank #2

DP#13

Bottom of the overflow pipe

DP#14



Screen on the overflow pipe

DP#15

Bottom of the overflow pipe with concrete splash pad

DP#16

Shell ladder and overflow pipe with an external weir box

Connecticut Water UCONN Tank #2

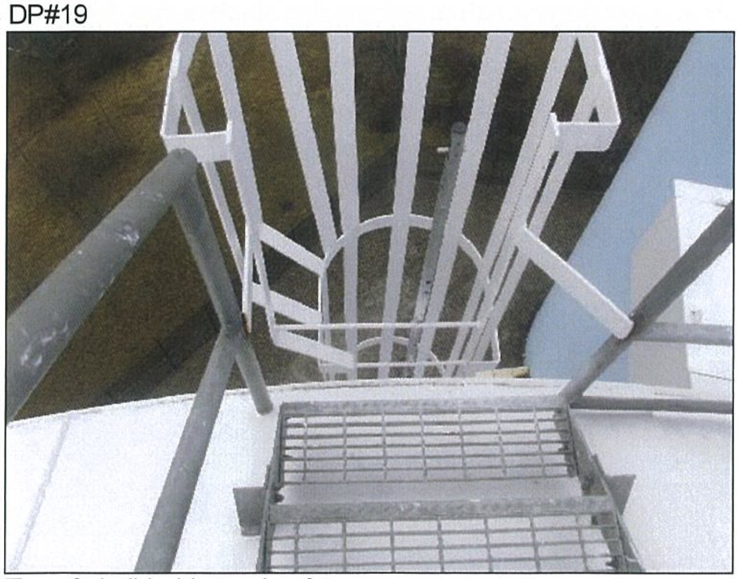
DP#17

Overflow pipe with external weir box and exterior shell

DP#18

Spalling on the concrete foundation

DP#19



Top of shell ladder and safety cage

DP#20

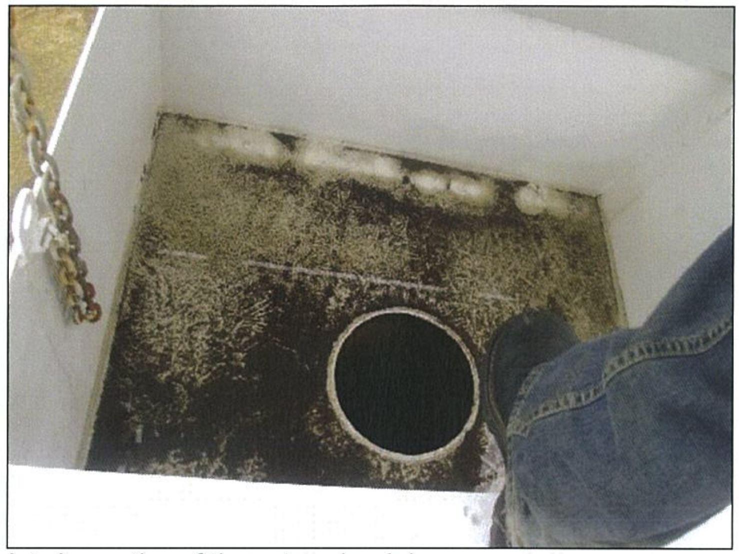
Shell ladder and safety cage

Connecticut Water UCONN Tank #2

DP#21

External weir box

DP#22



Interior portion of the external weir box

DP#23

Safety railing and center roof vent

DP#24

Safety railing

Connecticut Water UCONN Tank #2

DP#25

Safety railing and chain

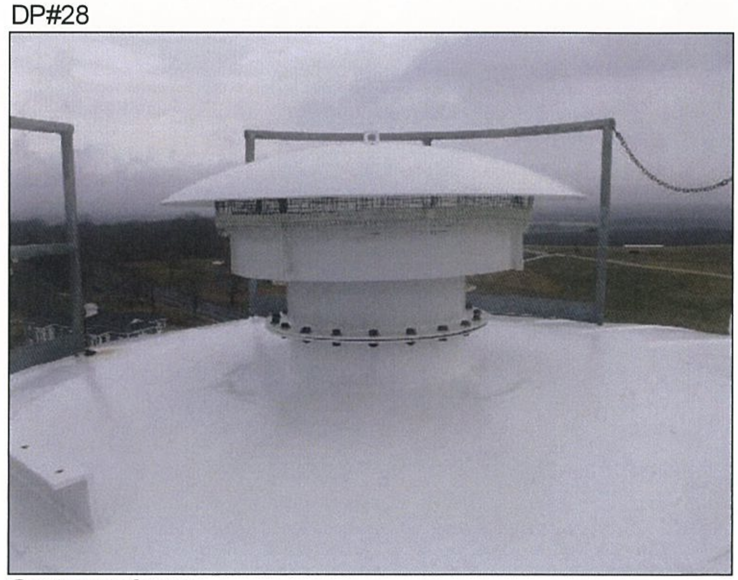
DP#26

Safety railing and perimeter roof hatch

DP#27

Secondary roof hatch

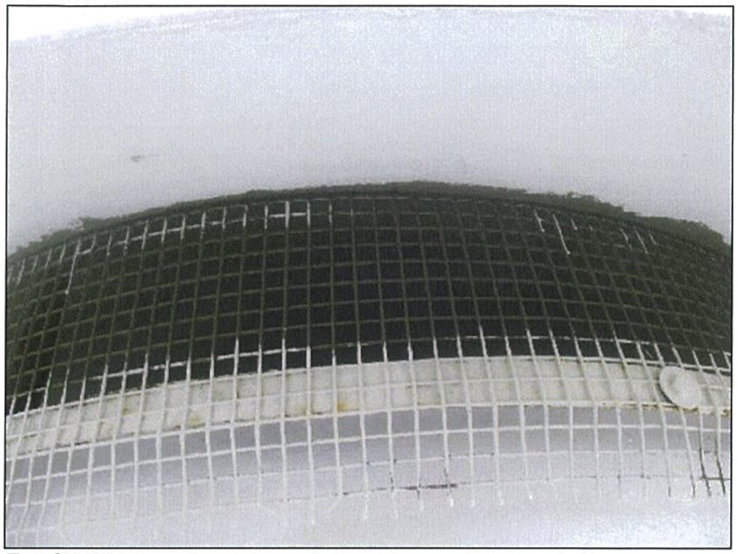
DP#28



Center roof vent

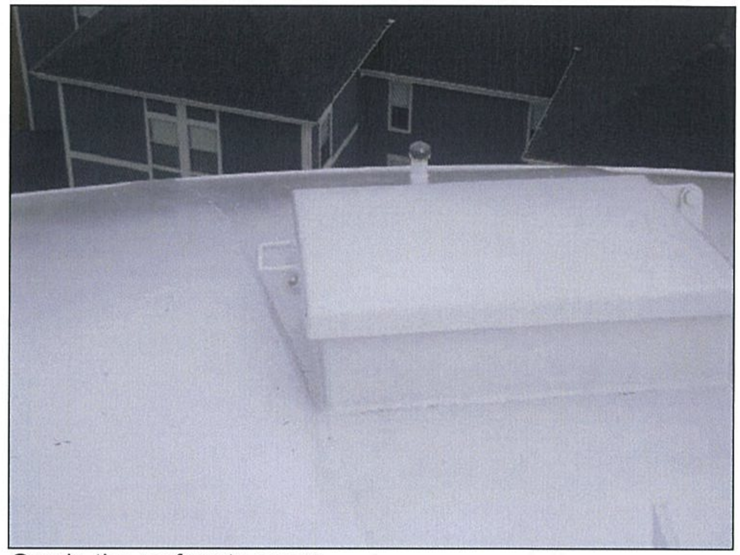
Connecticut Water UCONN Tank #2

DP#29



Roof vent screen

DP#30

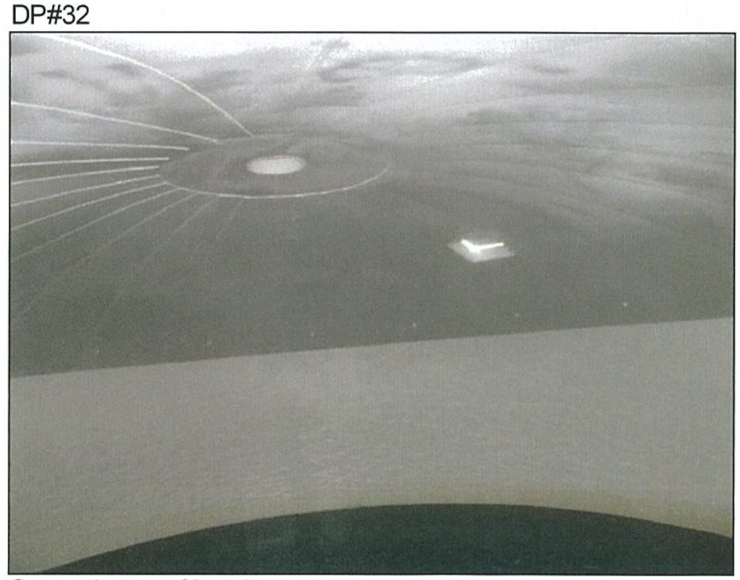


Gap in the roof vent screen

DP#31

Gap in the roof vent screen

DP#32



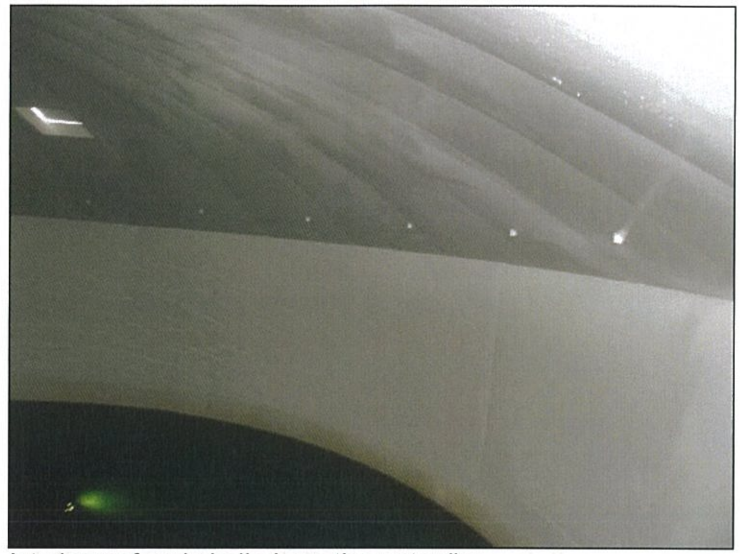
Secondary roof hatch

Connecticut Water UCONN Tank #2

DP#33

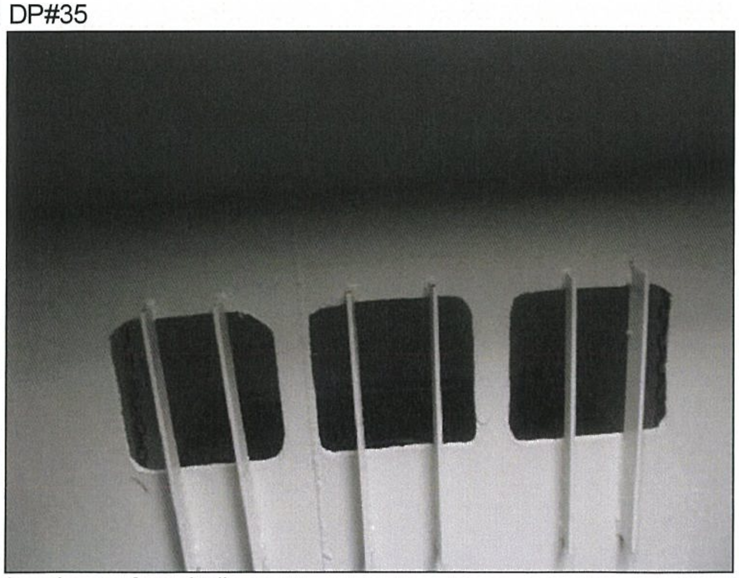
Locks on the roof vents

DP#34



Interior roof and shell above the water line

DP#35



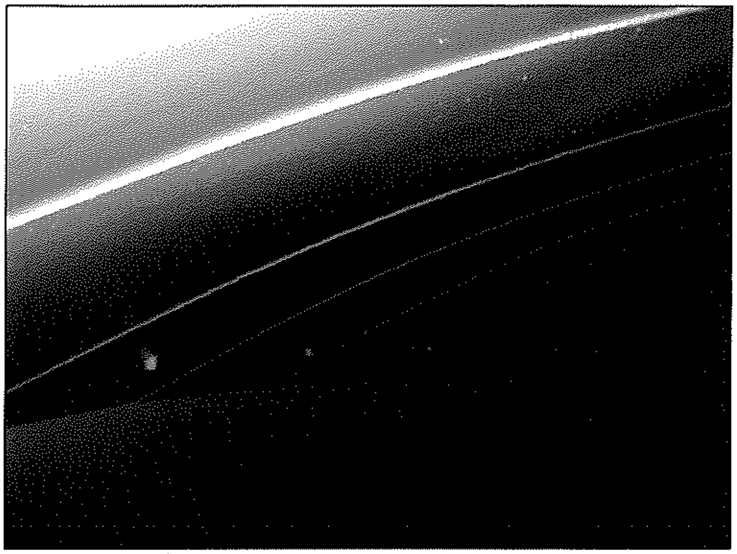
Interior roof to shell seam

DP#36

Interior roof to shell seam and perimeter roof hatch

Connecticut Water UCONN Tank #2

DP#37



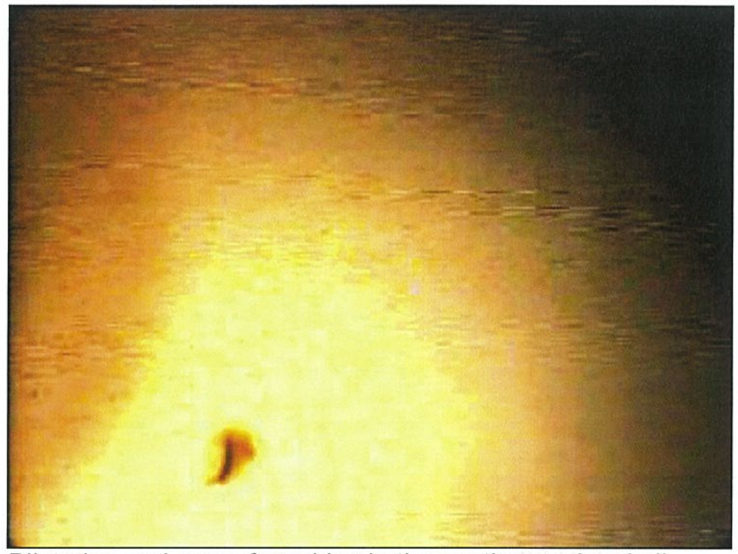
Overflow opening

UConn Standpipe

VS#1

Interior roof and hatch, roof vent
(Time 1:33)

VS#2

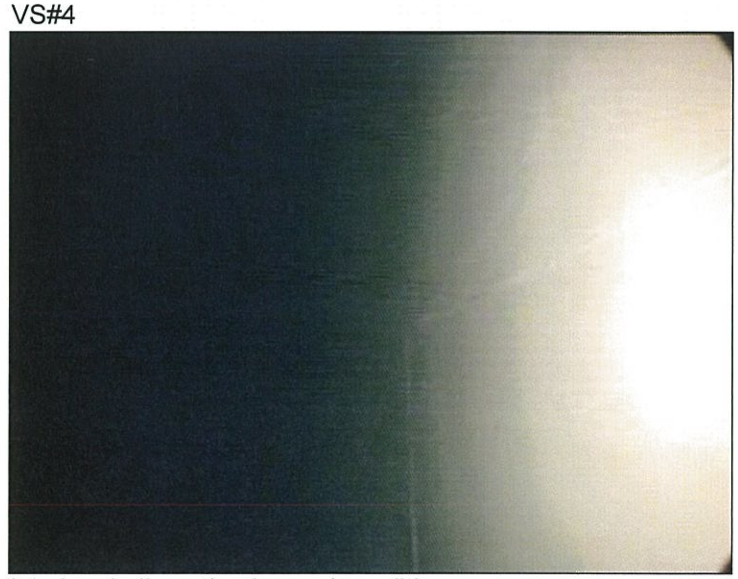


Blistering and area of cracking in the coating on the shell
(Time 7:31)

VS#3

Sag in coating on the shell below the weld seam
(Time 11:12)

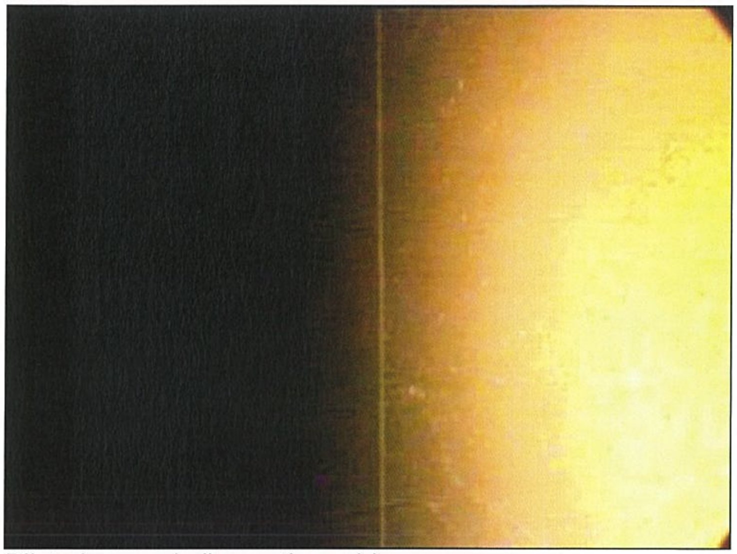
VS#4



Interior shell coating in good condition
(Time 17:25)

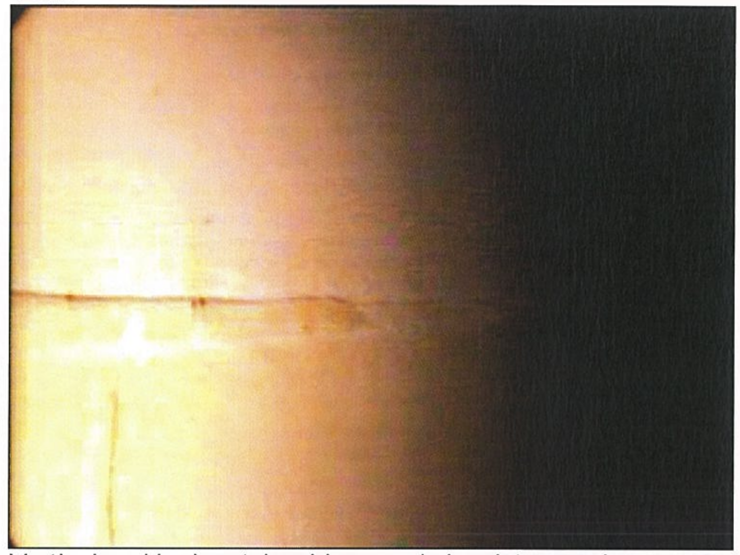
UConn Standpipe

VS#5



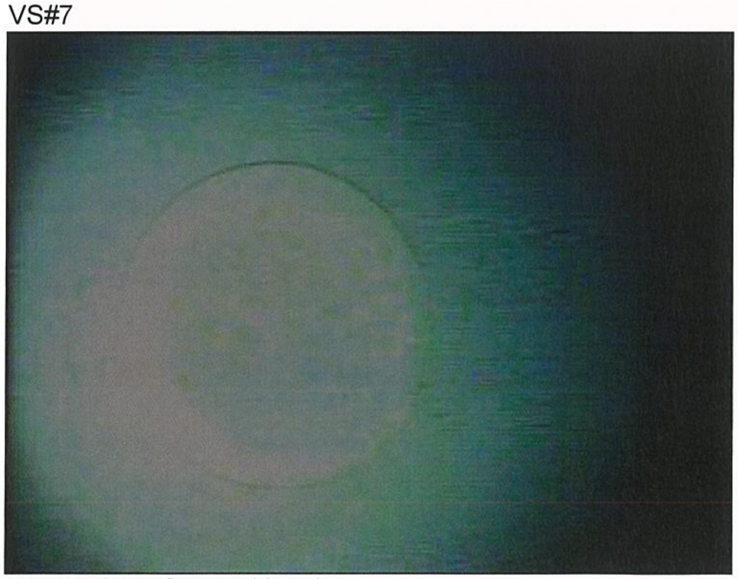
Blistering on shell near the weld seam
(Time 19:18)

VS#6



Vertical and horizontal weld seams/ pinpoint corrosion
(Time 24:34)

VS#7



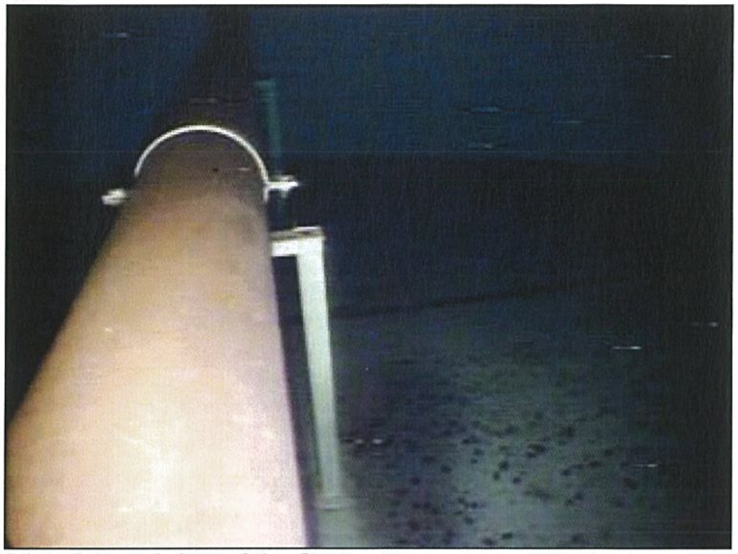
Interior view of ground hatch
(Time 25:15)

VS#8

Support brackets for the intlet pipe
(Time 25:49)

UConn Standpipe

VS#9



Inlet pipe and view of the floor
(Time 26:54)

VS#10

Opening of the inlet pipe
(Time 27:14)

VS#11

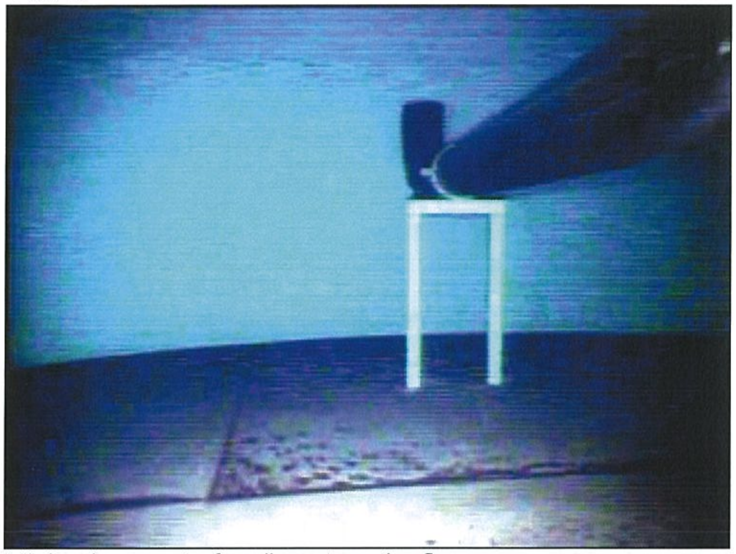
Inlet/outlet pipe
(Time 28:36)

VS#12

Support brackets for the inlet pipe
(Time 29:15)

UConn Standpipe

VS#13



Minimal amount of sediment on the floor
(Time 30:16)

CORROSION ENGINEERING
INFRASTRUCTURE TECHNOLOGIES

Water Storage Tank Report
Mansfield Depot
155 Bonemill Road Tank
CorrTech Job No. 7226

Prepared For:

Connecticut Water Company
93 West Main Street
Clinton, CT06413

Prepared By:

CorrTech, Inc.
25 South Street
Hopkinton, MA 01748

December 2013

STATEMENT OF LIMITATION

The conclusions presented in this document are based on the services described and not on tasks or procedures beyond the scope of the described procedures or the time and budgetary constraints imposed by the contract limitations.

CorrTech, Inc. has performed this assessment in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent consultants, and in accordance with the procedures established within CorrTech's quality assurance, quality control protocol.

CorrTech, Inc. shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld or not fully disclosed at the time the evaluation was performed.

Report Prepared by: Ted Lund
NACE Certified Coating Inspector #0050
API-653 Certified Tank Inspector #714
July 2016

Report Reviewed by: Mr. Craig Lower
NACE Corrosion Specialist No. 4386

TABLE OF CONTENTS

INTRODUCTION

On November 20, 2013 CorrTech representatives, Dan Palaez and Garth Lund performed a corrosion and structural assessment of the exterior and interior of the Mansfield Depot Bonemill Tank for the Connecticut Water Company.The inspection was conducted to establish the current condition of the tank's coatings and steel substrate. The tank inspected included:

300K Bonemill Road Tank

The tank was inspected in accordance with the latest version of AWWA D101-53 (86R) standard for water tank inspections, the M42 AWWA Tank Guidance Manual and requirements of CT DPH.

The interior of the reservoir was inspected with the TankRover remotely operated vehicle, while full. The TankRover is the only piece of equipment like it in the United States and was developed by CorrTech. By using the TankRover the interior of the tank was inspected with no special preparation, no additional disinfection and no downtime.

The TankRover is equipped with a surface-cleaning tool used to remove loose rust or debris in order to view the potential metal loss under the coating. The unit has high-powered thrusters, which are used to maneuver throughout the tank and are used to wash away bottom sediment for observations.

The exterior portion of the tank was inspected by walking the roof and shell portions that were accessible from the ground.
The objectives of the assessment were to:

1. Perform field inspections and tests to assess the structural and coating integrity of the tank.
2. Review the safety compliance of tank ladders and access.
3. Review sanitary conditions and protection
4. Provide recommendations for rehabilitation.

EXECUTIVE SUMMARY

The conditions and recommendations for the tank are briefly summarized in this section. For detailed information regarding tank conditions and the specific recommendations please refer to the designated section for the tank.

The exterior coating system is in good condition with mildew staining but no significant coating failure.

The interior of the tank has a few active corrosion cells, but otherwise shows no significant coating failure.

OBSERVATIONS

Photographs provided in the report were created from a digital camera and interior pictures were captured in digital format from the interior videotape. The interior images are as clear as our printed technology will allow. The copies in the report provide a reference for our comments. Keep in mind that for underwater video snaps, the videotape provides the greatest detail and should be viewed as part of the report.

A Posi-Tector 6000 was used to gather dry film thickness measurements on the exterior roof and shell surfaces.

300K Bonemill Road Tank

The reservoir is a welded steel structure, 36-ft in diameter and 40-ft high. There is currently no data available on when the tank was last inspected, cleaned and/or painted.

The tank has one 24-insquare roof hatch and one 24-in diameter round bolted ground level hatch. The roof hatch is equipped with the required 5-in sanitary curb and a 2-in overlapping hatch cover. The roof hatch was locked before and after the tank inspection.

INTERIOR

The interior of the tank was accessed through the existing 24-inroof hatch. The water level during the inspection was consistently 7-ft below the overflow.

Roof (ceiling)

The roof is a domed self-supporting steel structure with minor edge corrosion on the weld seams.

Ladders

This tank is not equipped with an interior ladder.

Shell

The shell was in good condition with a few isolated pinpoint corrosion cells formed on the weld seams. The corrosion cells were apparent in less than 1% of the area of the weld seam. Many corrosion cells were found in the areas where previous pitting was seen under the newer coating.

Floor

The floor of the tank had approximately 1-in of sediment with bare spots near the inlet/outlet pipe.

Inlet/ Outlet

The inlet and outlet pipe is combined located on the floor of the tank. The pipe is equipped with a sediment ring.

EXTERIOR

Roof

The roof coating was 100% intact with moderate chalking, with some minor localized mechanical damage.

The dry film thickness of the coating averaged 11.75 mils and ranged from a low of 6.7 to a high of 19 mils, see Appendix II.

Vent

The tank is equipped with a 12-in diameter mushroom vent. The vent cap is 14-in off the roof. The vent screening is intact.

Ladders and Railings

The shell has a vertical ladder that meets current OSHA dimensional requirements with a safety cage and locked anti climb. The ladder is not equipped with a safety climb device.

Shell

The shell coating was in good condition. There are some minor spot areas of de-lamination caused by rock damage. There is 40% mildew staining on the outside lower portion of the tank.

The coating thickness measured from a minimum of 10.8 mils to a maximum of 30.9 mils. The average paint thickness was 16.76 mils, see Appendix II.

Overflow

The interior overflow funnel connects to a pipe which runs through the shell and discharges from the top of the tank. The overflow was estimated at 6-in diameter and has intact fine mesh screening.

Foundation

The tank rests on a concrete ring wall foundation. There were minor cracks in the concrete and tight aggregate exposed on top but no spalling. The tank chime plate had minor edge corrosion.

RECOMMENDATIONS

<u>300K Bonemill Road Water Tank</u>

The tank is currently in good condition and requires no maintenance at this time.

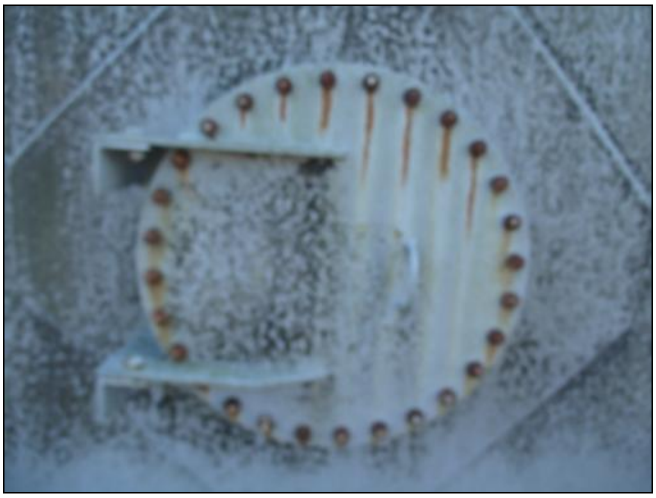
The overflow pipe should be extended from the top of the shell to within 24-in of grade. The discharge point should be equipped with a 24-mesh screen and/or flapper check valve.

It is recommended that the reservoir be inspected and possibly cleaned in 3 to 5 years.

Appendix I
Photographs

155 Bonemill Road Tank

DP 1
Overview



DP 2
Tank hatch 24-inch diameter

DP 3
Shell ladder and level indicator

DP 4
Mildew and moss staining on lower shell

155 Bonemill Road Tank

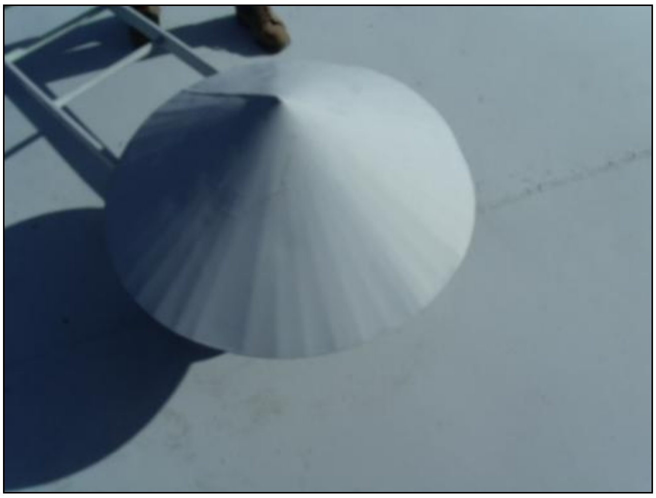
DP 5
Staining

DP 6
De-lamination caused by rock damage

DP 7
Concrete foundation hairline cracks and exposed aggregate

DP 8
Edge corrosion along chime plate

155 Bonemill Road Tank


DP 9
Roof vent

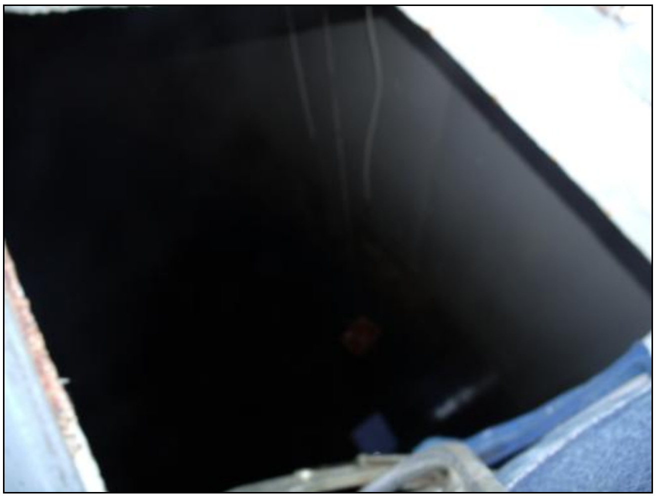

DP 10
Vent screening


DP 11
Roof plates

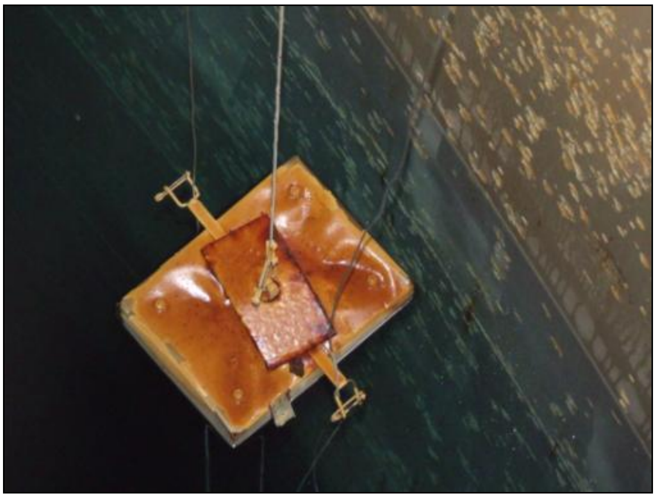

DP 12
Roof plate weld seam

155 Bonemill Road Tank

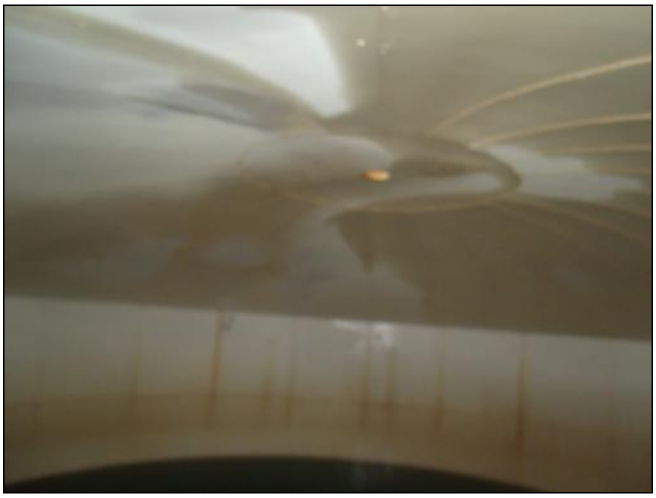
DP 13
Level indicator



DP 14
Roof hatch



DP 14
Level indicator float



DP 15
Interior overview

155 Bonemill Road Tank

DP 17
Level indicator fittings

DP 18
Interior roof to shell seam

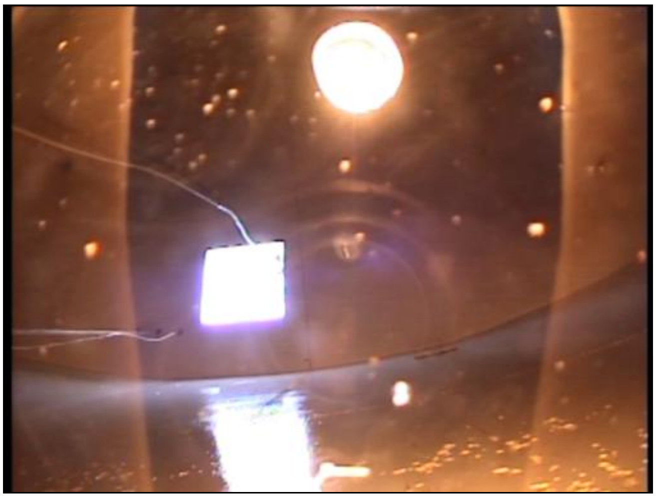
DP 19
Shell staining from iron in water

DP 20
Locked hatch

155 Bonemill Road Tank


DP 21
Screened overflow

155 Bonemill Road Tank

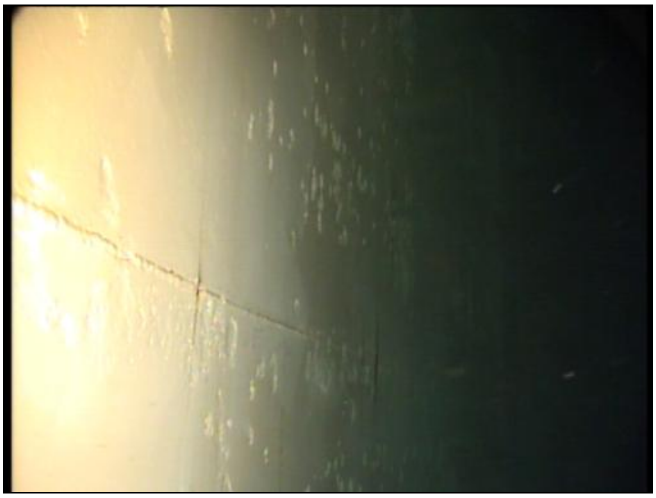

00:03
Roof hatch


2:36
Roof to shell seam


3:19
Overflow funnel


4:58
Roof plates and vent

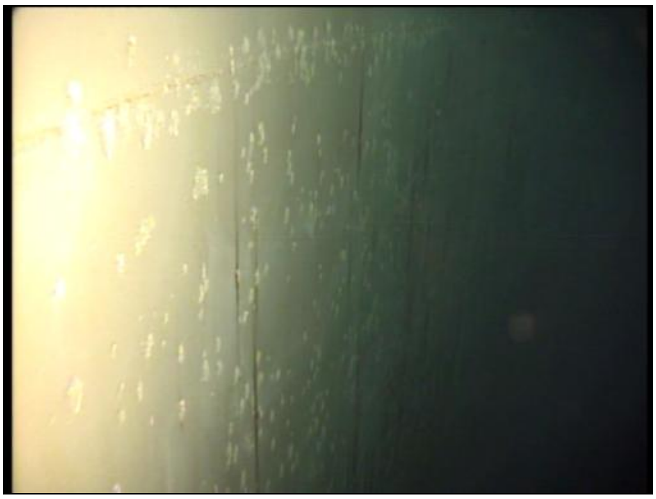
155 Bonemill Road Tank



6:21
Overcoated old corrosion pits

6:51
New corrosion cell

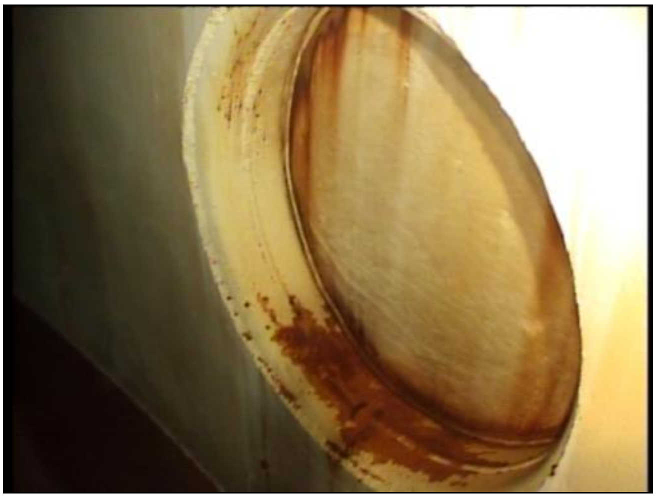
7:34
Brushed corrosion cell



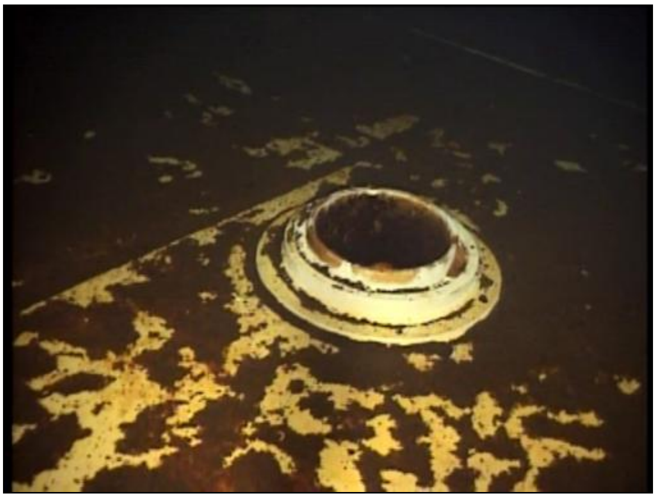
9:21
Corrosion cells in scarring

155 Bonemill Road Tank


19:22
Twisted level indicator wires


19:51
Shell man hole


20:02
Floor


20:27
Inlet and outlet pipe

155 Bonemill Road Tank

23:56
Sediment depth approx 1-inch

Appendix II
Dry Film Thickness Readings

Readings - Batch9_11/22/2013 3:47:15 PM

Reading	Time & Date	Coat 1 (mil)
1	10:54:59 AM 11/20/2013	11.6
2	10:55:02 AM 11/20/2013	13.2
3	10:55:06 AM 11/20/2013	14.7
4	10:55:08 AM 11/20/2013	14.0
5	10:55:11 AM 11/20/2013	14.9
6	10:55:13 AM 11/20/2013	15.0
7	10:55:16 AM 11/20/2013	17.0
8	10:55:18 AM 11/20/2013	14.7
9	10:55:25 AM 11/20/2013	18.6
10	10:55:28 AM 11/20/2013	19.3
11	10:55:30 AM 11/20/2013	23.4
12	10:55:35 AM 11/20/2013	16.0
13	10:55:37 AM 11/20/2013	15.4
14	10:55:39 AM 11/20/2013	17.1
15	10:55:47 AM 11/20/2013	17.6
16	10:55:50 AM 11/20/2013	14.8
17	10:55:52 AM 11/20/2013	30.9
18	10:56:02 AM 11/20/2013	11.7
19	10:56:05 AM 11/20/2013	12.2
20	10:56:07 AM 11/20/2013	10.8
21	10:56:13 AM 11/20/2013	18.8
22	10:56:16 AM 11/20/2013	16.7
23	10:56:18 AM 11/20/2013	14.9
24	10:56:24 AM 11/20/2013	18.0
25	10:56:26 AM 11/20/2013	13.9
26	10:56:28 AM 11/20/2013	13.1
27	10:56:33 AM 11/20/2013	11.7
28	10:56:35 AM 11/20/2013	13.5
29	10:56:37 AM 11/20/2013	12.6
30	10:56:45 AM 11/20/2013	17.6
31	10:56:47 AM 11/20/2013	10.9
32	10:56:49 AM 11/20/2013	11.4
33	10:56:58 AM 11/20/2013	18.2
34	10:57:00 AM 11/20/2013	17.6
35	10:57:02 AM 11/20/2013	18.2
36	10:57:09 AM 11/20/2013	20.3
37	10:57:11 AM 11/20/2013	16.8
38	10:57:13 AM 11/20/2013	21.2
39	10:57:19 AM 11/20/2013	21.0
40	10:57:21 AM 11/20/2013	21.2
41	10:57:23 AM 11/20/2013	25.0
42	10:57:30 AM 11/20/2013	19.9
43	10:57:32 AM 11/20/2013	17.6
44	10:57:34 AM 11/20/2013	17.7
45	10:57:43 AM 11/20/2013	23.6

Summary - Batch9_11/22/2013 3:47:15 PM

Reading	Time & Date	Coat 1 (mil)
Max		30.90
Min		10.80
Mean		16.76
StdDev.		4.14

Readings - Batch10_11/22/2013 3:47:15 PM

Reading	Time & Date	Coat 1 (mil)
1	1:25:43 PM 11/20/2013	18.1
2	1:25:45 PM 11/20/2013	17.2
3	1:25:47 PM 11/20/2013	19.0
4	1:25:49 PM 11/20/2013	15.5
5	1:25:54 PM 11/20/2013	16.0
6	1:25:58 PM 11/20/2013	12.9
7	1:26:00 PM 11/20/2013	14.0
8	1:26:02 PM 11/20/2013	13.9
9	1:26:05 PM 11/20/2013	9.7
10	1:26:08 PM 11/20/2013	10.7
11	1:26:10 PM 11/20/2013	10.2
12	1:26:14 PM 11/20/2013	9.2
13	1:26:17 PM 11/20/2013	13.0
14	1:26:19 PM 11/20/2013	14.0
15	1:26:22 PM 11/20/2013	14.0
16	1:26:25 PM 11/20/2013	9.7
17	1:26:27 PM 11/20/2013	10.3
18	1:26:29 PM 11/20/2013	10.4
19	1:26:31 PM 11/20/2013	11.8
20	1:26:33 PM 11/20/2013	12.4
21	1:26:35 PM 11/20/2013	12.1
22	1:26:37 PM 11/20/2013	14.6
23	1:26:39 PM 11/20/2013	14.3
24	1:26:41 PM 11/20/2013	12.2
25	1:26:55 PM 11/20/2013	11.0
26	1:27:00 PM 11/20/2013	9.4
27	1:27:02 PM 11/20/2013	9.2
28	1:27:04 PM 11/20/2013	9.6
29	1:27:08 PM 11/20/2013	12.5
30	1:27:15 PM 11/20/2013	8.8
31	1:27:17 PM 11/20/2013	10.1
32	1:27:19 PM 11/20/2013	11.5
33	1:27:23 PM 11/20/2013	12.1
34	1:27:27 PM 11/20/2013	12.6
35	1:27:33 PM 11/20/2013	10.4
36	1:27:35 PM 11/20/2013	11.7
37	1:27:37 PM 11/20/2013	10.5
38	1:27:39 PM 11/20/2013	9.0
39	1:27:44 PM 11/20/2013	8.9
40	1:27:45 PM 11/20/2013	6.7
41	1:27:48 PM 11/20/2013	10.3
42	1:27:50 PM 11/20/2013	9.3
43	1:28:03 PM 11/20/2013	11.8
44	1:28:05 PM 11/20/2013	9.3
45	1:28:08 PM 11/20/2013	8.7

Summary - Batch10_11/22/2013 3:47:15 PM

Reading	Time & Date	Coat 1 (mil)
Max		19.00
Min		6.70
Mean		11.75
StdDev.		2.67

Water Storage Tank Report
Mansfield Depot – Prison Tank
CorrTech Job No. 7226

Prepared For:

Connecticut Water Company
93 West Main St
Clinton, CT 06413

Prepared By:

CorrTech, Inc.
25 South Street
Hopkinton, MA 01748

December 2013

STATEMENT OF LIMITATION

The conclusions presented in this document are based on the services described and not on tasks or procedures beyond the scope of the described procedures or the time and budgetary constraints imposed by the contract limitations.

CorrTech, Inc. has performed this assessment in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent consultants, and in accordance with the procedures established within CorrTech's quality assurance, quality control protocol.

CorrTech, Inc. shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld or not fully disclosed at the time the evaluation was performed.

Report Prepared by: Ted Lund
NACE Certified Coating Inspector #0050
API-653 Certified Tank Inspector #714
July 2016

Report Reviewed by: Mr. Craig Lower
NACE Corrosion Specialist No. 4386

TABLE OF CONTENTS

INTRODUCTION

On November 20, 2013 CorrTech representatives, Dan Palaez and Garth Lund performed a corrosion and structural assessment of the exterior and interior of the Mansfield Depot Prison Tank for the Connecticut Water Company.The inspection was conducted to establish the current condition of the tank's coatings and steel substrate. The tank inspected included:

700K Prison Tank

The tank was inspected in accordance with the latest version of AWWA D101-53 (86R) standard for water tank inspections, the M42 AWWA Tank Guidance Manual and requirements of CT DPH.

The interior of the reservoir was inspected with the TankRover remotely operated vehicle, while full. The TankRover is the only piece of equipment like it in the United States and was developed by CorrTech. By using the TankRover the interior of the tank was inspected with no special preparation, no additional disinfection and no downtime.

The TankRover is equipped with a surface-cleaning tool used to remove loose rust or debris in order to view the potential metal loss under the coating. The unit has high-powered thrusters, which are used to maneuver throughout the tank and are used to wash away bottom sediment for observations.

The exterior portion of the tank was inspected by walking the roof and shell portions that were accessible from the ground.

The objectives of the assessment were to:

1. Perform field inspections and tests to assess the structural and coating integrity of the tank.
2. Review the safety compliance of tank ladders and access.
3. Review sanitary conditions and protection
4. Provide recommendations for rehabilitation.

EXECUTIVE SUMMARY

The conditions and recommendations for the tank are briefly summarized in this section. For detailed information regarding tank conditions and the specific recommendations please refer to the designated section for the tank.

The exterior coating system is in good condition but heavily stained on the lower shell rings with mildew.

The interior coating system is in good condition with only minor localized corrosion cells formed at old pit scar sites.

OBSERVATIONS

Photographs provided in the report were created from a digital camera and interior pictures were captured in digital format from the interior videotape. The interior images are as clear as our printed technology will allow. The copies in the report provide a reference for our comments. Keep in mind that for underwater video snaps, the videotape provides the greatest detail and should be viewed as part of the report.

A Posi-Tector 6000 was used to gather dry film thickness measurements on the exterior roof and shell surfaces.

700K Prison Tank

The reservoir is a welded steel structure, 46-ft in diameter and 56-ft high. There is currently no data available on when the tank was last inspected, cleaned and/or painted.

The tank has one 30-in square roof hatch and one 24-in diameter round bolted ground level hatch. The roof hatch is equipped with the required 5-in sanitary curb and a 2-in overlapping hatch cover. The roof hatch was locked before and after the inspection.

INTERIOR

The interior of the tank was accessed through the existing 30-insquare perimeter hatch. The water level during the inspection was consistently 15-ft below the overflow.

Roof (ceiling)

The roof is a flat cone structure with a single central support column. The beams and stiffeners were in good condition with minor areas of edge corrosion where they met the top of the shell

Ladders

This tank is not equipped with an interior ladder.

Shell

The shell coating had only a few corrosion cells forming on the weld seams and in some of the areas of over coated pitting. Shallow surface pitting was found behind some of the corrosion cells most notably in the cells that had formed on the tank shell.

Floor

The floor had a 0.5-in coating of sediment. No corrosion was found on the perimeter weld seam.

Inlet/ Outlet

The tank has a combined floor level inlet/outlet pipe. This pipe is equipped with a sediment ring.

EXTERIOR

Roof

The roof coating was 100% intact with moderate chalking, with some minor mechanical damage.

The dry film thickness of the coating averaged 10.08 mils and ranged from a low of 5.7 to a high of 17.7 mils, see Appendix II.

Vent

The tank is equipped with central finial vent that is 12-in diameter. The vent cap is 12-in from the roof and the vent is equipped with intact screening.

Ladders and Railings

The shell has a vertical ladder that meets current OSHA dimensional requirements with a safety cage. The ladder is not equipped with a safety climb device.

Shell

The tank shell coating had minor to moderate chalking and the lower shell rings were heavily stained from mildew.

The coating thickness measured from a minimum of 6.4 mils to a maximum of 27.6 mils. The average paint thickness was 15.52 mils, see Appendix II.

Overflow

The overflow pipe was estimated at 6-inch in diameter and discharges from the top shell ring. The pipe is fitted with intact screening.

Foundation

The tank rests on a concrete ring wall foundation. Portions of the chime plate and foundation were covered with soil and grass in areas. In the visible areas both the chime and the foundation appeared to be in good condition.

RECOMMENDATIONS

The tank foundation should be exposed above the surrounding soil to provide good drainage away from the steel chime.

The overflow pipe should be extended from the top of the shell to within 24-in of grade. The discharge point should be equipped with a 24-mesh screen and/or flapper check valve.

The tank should be scheduled for an inspection in 5-years.

Appendix I
Photographs

Mansfield Depot - Prison Tank


DP 1
Overview


DP 2
Shell man hole 24-inch


DP 3
Lower shell mildew staining


DP 4
Upper shell coating

Mansfield Depot - Prison Tank


DP 5
Overflow pipe with fine mesh screen


DP 6
Clean upper shell coating


DP 7
Chime plate


DP 8
Partially buried area of the chime plate

Mansfield Depot - Prison Tank

DP 9
Shell ladder and anti-climb

DP 10
Intact vent screening

DP 11
Vent cap and roof ladder

DP 12
Roof coating

Mansfield Depot - Prison Tank


DP 13
Roof plate weld seams


DP 14
Roof hatch


DP 15
Level indicator float


DP 16
Interior overview

Mansfield Depot - Prison Tank


DP 17
Interior shell coating


DP 18
Interior roof rafter


DP 19
Level indicator


DP 20
Locked roof hatch

Mansfield Depot - Prison Tank

00:01
Roof hatch

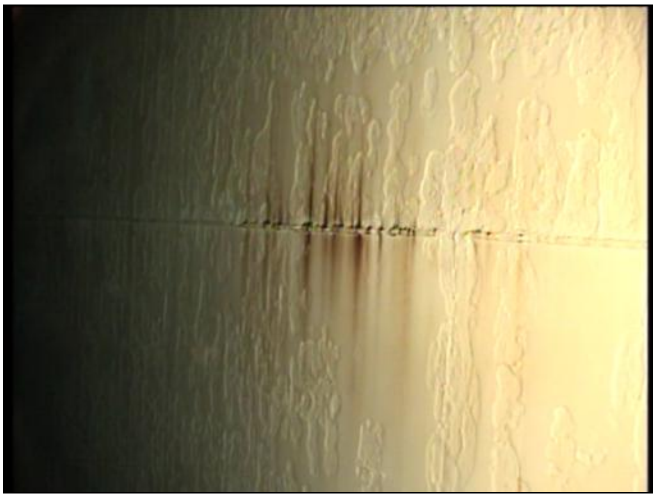
:08
Level indicator

2:14
Roof plates and rafters

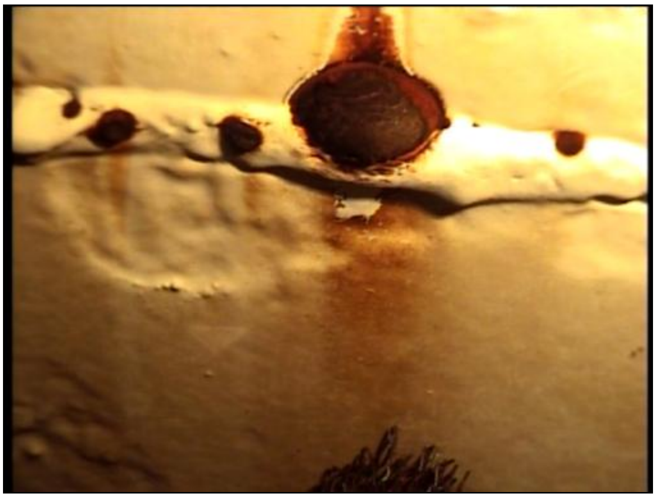
4:31
Support column

Mansfield Depot - Prison Tank


6:04
Shell wall with overcoated scarring


6:31
Weld seam corrosion

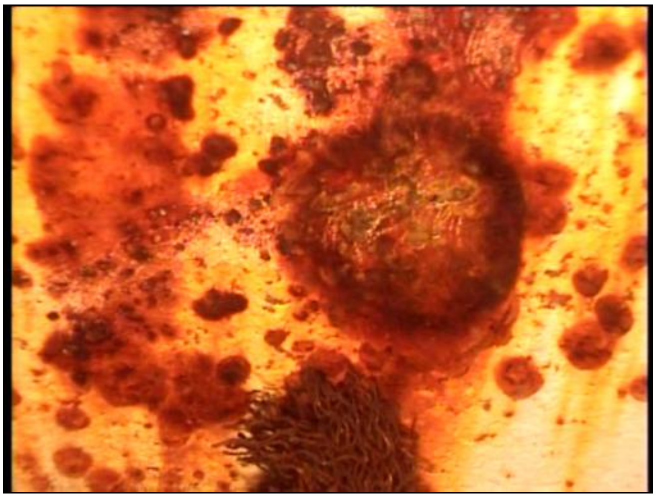

14:06
Corrosion cell


14:44
Brushed corrosion cell

Mansfield Depot - Prison Tank


24:46
Floor


25:56
Lower shell corrosion cell


26:52
Pitting


28:25
Shell man hole

Mansfield Depot - Prison Tank


28:44
Column base


29:17
Inlet/outlet pipe with sediment ring


29:57
Sediment depth 1/2-inch

Appendix II
Dry Film Thickness Readings

Readings - Batch11_11/22/2013 3:47:15 PM

Reading	Time & Date	Coat 1 (mil)
1	2:05:46 PM 11/20/2013	14.4
2	2:05:48 PM 11/20/2013	11.8
3	2:05:50 PM 11/20/2013	14.8
4	2:05:59 PM 11/20/2013	8.6
5	2:06:01 PM 11/20/2013	6.4
6	2:06:03 PM 11/20/2013	6.7
7	2:06:10 PM 11/20/2013	21.1
8	2:06:12 PM 11/20/2013	18.1
9	2:06:14 PM 11/20/2013	18.7
10	2:06:22 PM 11/20/2013	11.4
11	2:06:25 PM 11/20/2013	12.4
12	2:06:27 PM 11/20/2013	13.5
13	2:06:38 PM 11/20/2013	11.5
14	2:06:43 PM 11/20/2013	11.3
15	2:06:49 PM 11/20/2013	9.6
16	2:06:51 PM 11/20/2013	9.0
17	2:06:53 PM 11/20/2013	9.0
18	2:06:58 PM 11/20/2013	8.7
19	2:07:05 PM 11/20/2013	21.2
20	2:07:07 PM 11/20/2013	15.9
21	2:07:10 PM 11/20/2013	14.4
22	2:07:13 PM 11/20/2013	13.5
23	2:07:15 PM 11/20/2013	13.7
24	2:07:17 PM 11/20/2013	12.1
25	2:07:23 PM 11/20/2013	13.8
26	2:07:27 PM 11/20/2013	15.4
27	2:07:38 PM 11/20/2013	11.0
28	2:07:40 PM 11/20/2013	12.7
29	2:07:42 PM 11/20/2013	12.1
30	2:07:50 PM 11/20/2013	13.8
31	2:07:52 PM 11/20/2013	17.9
32	2:07:54 PM 11/20/2013	17.1
33	2:08:01 PM 11/20/2013	23.8
34	2:08:03 PM 11/20/2013	19.7
35	2:08:06 PM 11/20/2013	16.3
36	2:08:20 PM 11/20/2013	25.0
37	2:08:24 PM 11/20/2013	24.3
38	2:08:26 PM 11/20/2013	27.6
39	2:08:44 PM 11/20/2013	22.3
40	2:08:46 PM 11/20/2013	23.5
41	2:08:48 PM 11/20/2013	21.7
42	2:09:18 PM 11/20/2013	21.1
43	2:09:20 PM 11/20/2013	18.6
44	2:09:22 PM 11/20/2013	16.9
45	2:09:32 PM 11/20/2013	16.0

Summary - Batch11_11/22/2013 3:47:15 PM

Reading	Time & Date	Coat 1 (mil)
Max		27.60
Min		6.40
Mean		15.52
StdDev.		5.22

Readings - Batch12_11/22/2013 3:47:15 PM

Reading	Time & Date	Coat 1 (mil)
1	2:51:49 PM 11/20/2013	10.8
2	2:51:51 PM 11/20/2013	13.2
3	2:51:54 PM 11/20/2013	12.8
4	2:51:56 PM 11/20/2013	11.6
5	2:51:58 PM 11/20/2013	10.6
6	2:52:00 PM 11/20/2013	14.3
7	2:52:07 PM 11/20/2013	9.9
8	2:52:10 PM 11/20/2013	7.0
9	2:52:12 PM 11/20/2013	11.2
10	2:52:16 PM 11/20/2013	7.8
11	2:52:18 PM 11/20/2013	10.7
12	2:52:20 PM 11/20/2013	6.6
13	2:52:28 PM 11/20/2013	6.6
14	2:52:30 PM 11/20/2013	5.7
15	2:52:32 PM 11/20/2013	6.4
16	2:52:37 PM 11/20/2013	9.2
17	2:52:39 PM 11/20/2013	9.2
18	2:52:41 PM 11/20/2013	11.8
19	2:52:46 PM 11/20/2013	17.7
20	2:52:48 PM 11/20/2013	9.9
21	2:52:50 PM 11/20/2013	11.7
22	2:52:52 PM 11/20/2013	11.1
23	2:52:54 PM 11/20/2013	11.2
24	2:52:56 PM 11/20/2013	11.0
25	2:53:09 PM 11/20/2013	8.0
26	2:53:13 PM 11/20/2013	8.0
27	2:53:31 PM 11/20/2013	11.6
28	2:53:33 PM 11/20/2013	6.4
29	2:53:35 PM 11/20/2013	8.8
30	2:53:43 PM 11/20/2013	8.3
31	2:53:45 PM 11/20/2013	11.9
32	2:53:47 PM 11/20/2013	11.1
33	2:53:49 PM 11/20/2013	9.7
34	2:53:51 PM 11/20/2013	8.7
35	2:53:53 PM 11/20/2013	9.9
36	2:53:58 PM 11/20/2013	10.5
37	2:54:00 PM 11/20/2013	11.2
38	2:54:03 PM 11/20/2013	13.2
39	2:54:09 PM 11/20/2013	11.6
40	2:54:11 PM 11/20/2013	9.4
41	2:54:17 PM 11/20/2013	12.1
42	2:54:44 PM 11/20/2013	9.5
43	2:54:46 PM 11/20/2013	8.9
44	2:54:48 PM 11/20/2013	9.2
45	2:54:51 PM 11/20/2013	7.8

Summary - Batch12_11/22/2013 3:47:15 PM

Reading	Time & Date	Coat 1 (mil)
Max		17.70
Min		5.70
Mean		10.08
StdDev.		2.34

APPENDIX J

Water Transmission and Distribution System Mains Assessment

APPENDIX J - CONDITION ASSESSMENT

J.1 Transmission Mains

Fenton River Wellfield

The 8-inch transmission mains from Wells A, B, and C to the clearwell date from 1949. These are believed to be in good condition.

The 8-inch transmission main from Well D to the clearwell dates from 1959. This main is believed to be in fair condition.

The 12-inch transmission main from the clearwell to the Towers Tanks dates from 1959. This main is in good condition.

Willimantic River Wellfield

The 8-inch transmission main leading from Well #1 dates from 1970. This main is believed to be in good condition.

The 8-inch transmission main leading from Well #2 dates from 1974. This main is believed to be in good condition.

The 8-inch transmission main leading from Well #3 dates from 1958. This main is believed to be in good condition.

The 8-inch transmission main leading from Well #4 dates from 1998. This main is believed to be in good condition.

The 10-inch, 12-inch, and 16-inch mains leading from the wellfield to the Willimantic River Wellfield Chemical Building date from 1970. These mains are believed to be in good condition.

The 16-inch main from the Willimantic River Wellfield Chemical Building to the Main Campus was replaced in its entirety in 2016. This transmission main is in excellent condition.

The 10-inch and 8-inch mains leading from the Willimantic River Wellfield Chemical Building to the Depot Campus likely date from the 1940s. These are believed to be in fair condition.

J.2 Distribution Mains – Main Campus

Line Group A – High Pressure Line to Charter Oak Apartments

The high-pressure main to the Towers Loop zone was originally installed to serve Charter Oak Apartments in 2003. It is believed to be in excellent condition.

Line Group B – High Head Pump Station and North Eagleville Road

Many of the mains in the vicinity of the High Head Pump Station were installed in the 1980s, although newer mains supporting the Towers Loop zone were installed in 2003. These mains are believed to be in good to excellent condition.

The North Eagleville Road area is primarily served from mains that date from the 1950s. The majority of these 10-inch and larger mains are considered to be in fair condition.

Line Group C – Towers Loop Zone

Mains serving Husky Village and Charter Oak Apartments were installed in 2003-2005. These mains are believed to be in excellent condition.

New mains in this zone were recently installed on Discovery Drive in 2016. The new mains are in excellent condition.

Line Group D – Storrs Road (Route 195)

The 8-inch, 10-inch, and 12-inch mains date from the 1920s and are believed to be in fair condition. They include some of the oldest mains on campus.

The 8-inch main south of Mansfield Road dates from the 1950s and is believed to be in fair condition.

Line Group E – North Eagleville Road

Generally coincident with parts of Line Group B, the 6-inch main in this area dates from the 1920s and is one of the oldest mains on campus. It is believed to be in fair condition.

Line Group F – Glen Brook Road

This group connects water mains on Storrs Road to Hillside Road. The 12-inch diameter main near North Eagleville Road is believed to be in fair condition, as is the 8-inch transite section near Hillside Road.

The 8-inch ductile iron section near the Gentry Building was replaced in 2003 and is believed to be in good condition.

Line Group G – Horsebarn Hill Road

The 12-inch and 10-inch pipes serving campus buildings on Horsebarn Hill Road date from the 1920s. These mains are believed to be in fair condition.

Line Group H – Hillside Road and South Campus Loop

The 8-inch cast iron mains in this group date from the 1940s and lie on Hillside Road, route through West Campus to Mansfield Road, and extend to Coventry Road. These mains are believed to be in fair condition.

The 8-inch ductile iron mains were installed in 2003 along Coventry Road and Bolton Road, looping back to Hillside Road. The more recent mains are considered to be in excellent condition.

Line Group J – Auditorium Road to Chemistry Building

These mains were installed in 1996 and 1999 as part of the UConn 2000 program. The mains are believed to be in excellent condition.

Line Group K – Dedicated Express Line to South Campus Chiller Station

This 12-inch line was installed in 1999-2000 generally along Route 195 and Coventry Road and is believed to be in excellent condition.

Line Group L – Central Campus

This group serves the center of campus from Storrs Road to Hillside Road and from the Wilbur Cross Building to Gilbert Road. The 8-inch section parallel to Mansfield Road dates from the 1920s, as do intermittent 6-inch sections. These mains are believed to be in fair condition.

The 12-inch mains fronting the Homer Babbidge Library were installed in 1999 and 2000. This includes mains that are within a utility tunnel. These are believed to be in excellent condition.

Line Group M – Chiller Station to South Campus

This 8-inch line was installed in 1999 and is believed to be in good condition.

Line Group N – Alumni Drive and Hilltop Apartments

The 8-inch cast iron main on Alumni Drive was originally installed in the 1960s and is believed to be in good condition.

The 8-inch ductile iron main from Hilltop Complex to Hilltop Apartments was installed in 2003 and is believed to be in excellent condition.

Line Group P – LeDoyt Road and WPCA

The 8-inch mains in this area were installed from 1992-1996. The mains are believed to be in good condition.

Line Group Q – North Eagleville Road

This group includes the 16-inch mains installed on Towers Loop Road and North Eagleville Road in 2010. These mains are believed to be in excellent condition.

J.3 Distribution Mains – Depot Campus

Records of main installation by Mansfield Training School on the current Depot Campus are limited. Some mains may date back to the 1910s and 1920s (when the school water system as served by the Willimantic River Wellfield was founded), while others likely date from the 1940s and 1950s (when use of the facility was reaching its peak). However, based on historic mapping nearly all of the existing mains were in place by 1983, and UConn has made few changes to the system since acquiring it in 1993. Thus, the water mains for entire Depot Campus are believed to be in fair condition.

APPENDIX K

Leak Detection Reports

15 Sept 2016

To : Paul Radicchi

From : Adam Czepiel, Leak Detection CWC

CC: Don Schumacher

UCONN leak detection survey August 2016

The biannual UCONN leak detection and Fire hydrant survey was conducted from 23 August to 01 September 2016. The areas surveyed were the main UCONN campus and the UCONN depot campus. A basic survey was conducted which included listening on both new and existing fire hydrants, and updating the current distribution maps as requested by Paul Radicchi.

Concluding the survey, no damage to hydrants, nor apparent system leaks were found.

Heavy construction is being performed across the UCONN campuses, and a small percentage of the hydrants were not accessible for inspection. The map was updated by hand to include the general location and colors of the newly installed and existing hydrants. The UCONN hydrants are color coded to identify the different pressure systems in the overall distribution system.

Due to the large amount of construction activities, a few hydrants were found to be leaking, and having loose caps, as they were not fully closed. The hydrants were briefly flushed, secured, and re inspected to ensure no hydrant leakage was remaining. Contractors abounded in the area, and evidence of borrowing water and temporary irrigation was plain to see, and any open or loose hydrants and caps discovered were tightened and secured as they were found.

Pictured below are one of the gray hydrants from behind the Nathan Hale dormitory, and hydrant diagonally across from the Gampel Pavillion.

The Tally of Hydrants for each separate campus is listed below.

UCONN Main Campus

183 Hydrants

71 Hydrants new or not indicated on map

13 Hydrants not located or not accessible due to construction

25 RED Hydrants

130 YELLOW Hydrants

16 ORANGE Hydrants

2 GRAY Hydrants

Uconn Depot Campus

50 Hydrants

11 Hydrants new or not indicated on map

6 Hydrants not located or not accessible due to construction

7 RED Hydrants

43 YELLOW Hydrants

23 February 2017

To : Paul Radicchi

From : Adam Czepiel, Leak Detection CWC

UCONN leak detection survey August 2016 Methodology

The biannual UCONN leak detection and Fire hydrant survey was conducted from 23 August to 01 September 2016. The areas surveyed were the main UCONN campus and the UCONN depot campus. A basic survey was conducted which included listening on both new and existing fire hydrants, and updating the current distribution maps as requested by Paul Radicchi.

The electronic equipment used for the survey:

1- SEBA KMT model HL50 handheld amplifier and filter, and SEBA KMT PAM-B-2 magnetic microphone and David Clark Headphones.
2- SEBA KMT model HL5000 portable amplifier and filter, with both SEBA KMT PAM-B-2 magnetic microphone, and accompanying SEBA KMT model GM-80 direct contact ground microphone, and David Clark Headphones.

The equipment used for the acoustic leak detection and hydrant survey, consists of a hand held audio amplifier, adjustable audio filter, and a microphone with either a magnetic base, or a direct ground contact microphone used on paved or grassy areas, and closed cell aviation grade headphones. The aviation grade headphones, are insulated which helps reduce background and street noise, and are physically more durable than consumer grade headphones.

The fire hydrants are "Listened" on by removing one of the caps, and placing the magnetic microphone onto the internal hydrant shaft, or if this isn't possible, magnetically mounted on the external hydrant base. The operator then uses the unit and headphones, and reinstalls the cap after listening for leak noises. If leak noises are heard, the first thing the operator does, is to check if the hydrant is fully closed. During the survey there were 6 hydrants that were found slightly open, producing a "leak noise", these were closed, and the sounds went silent. The acoustic units amplify sounds on the hydrants (connected to the water mains). Water leaks on metallic water mains and hydrants sound similar to a hissing and buzzing sound. Concluding the survey, no damage to hydrants, nor apparent system leaks were found.

APPENDIX L

Source Meter Calibration Reports and UConn Metering Specifications

THE CONNECTICUT WATER COMPANY

Date : 1/15/2019

Time : 1:30 PM

Company Name: Connecticut Water Company

Meter Location : UCONN Fenton Well B

Technician: S.Pierpont, B.Buhler, T.Dowling

MAKE : Sensus

SIZE : 4"

MODEL W-1000

SERIAL # 66109021

REGISTER READING

BEFORE TEST 455,853,810

AFTER : 455,855,920

STATIC PRESS. 25 PSI

REGISTER UNIT OF MEASURE Gallon

FLOW RATE IN GPM OR CU/FT	STOP	START	METER VOLUME	TESTER VOLUME	TESTER ACCURACY	TESTED METER ACCURACY %
190 GPM	**455855920**	**455853810**	**2110**	**2030.0**	**100.0**	**103.94**

REMARKS : Calculations (Meter Volume / Tester Volume) X Tester Accuracy = Tested Meter Accuracy

(2110 / 2030) X 100 = 104%

Tester Accuracy determined by the flow rate and the flow rate curve provided by Sensus

THE CONNECTICUT WATER COMPANY

Date : 1/15/2019 Time : 12:30PM

Company Name: Connecticut Water Company

Meter Location : UCONN Fenton Well C

Technician: S.Pierpont, B.Buhler, T.Dowling

MAKE : Sensus SIZE : 4"

MODEL W-1000 SERIAL # 66109022

REGISTER READING

BEFORE TEST 307,770,200 AFTER : 307,776,565

STATIC PRESS. 25 PSI REGISTER UNIT OF MEASURE Gallon

FLOW RATE IN GPM OR CU/FT	STOP	START	METER VOLUME	TESTER VOLUME	TESTER ACCURACY	TESTED METER ACCURACY %
230 GPM	**307774200**	**307772790**	**1410**	**2064.0**	**100.1**	**68.38**
190 GPM	**307776565**	**307774510**	**2055**	**2000.0**	**100.4**	**103.16**

REMARKS : Calculations (Meter Volume / Tester Volume) X Tester Accuracy = Tested Meter Accuracy

(2055 / 2000) X 100.4 = 103%

Tester Accuracy determined by the flow rate and the flow rate curve provided by Sensus

THE CONNECTICUT WATER COMPANY

Date : 1/15/2019 Time : 11:20am

Company Name: Connecticut Water Company

Meter Location : UCONN Fenton Well D

Technician: S.Pierpont, B.Buhler, T.Dowling

MAKE : Sensus SIZE : 4"

MODEL W-1000 SERIAL # 66109020

REGISTER READING

BEFORE TEST 162,326,875 AFTER : 162,328,130

STATIC PRESS. 20 PSI REGISTER UNIT OF MEASURE Gallon

FLOW RATE IN GPM OR CU/FT	STOP	START	METER VOLUME	TESTER VOLUME	TESTER ACCURACY	TESTED METER ACCURACY %
223 GPM	**162328130**	**162326580**	**1550**	**1546.0**	**100.1**	**100.36**

REMARKS : Calculations (Meter Volume / Tester Volume) X Tester Accuracy = Tested Meter Accuracy

(1550 / 1546) X 100.1 = 100%

Tester Accuracy determined by the flow rate and the flow rate curve provided by Sensus

THE CONNECTICUT WATER COMPANY

Date : 1/16/2019 Time : 11:30am

Company Name: Connecticut Water Company

Meter Location : UCONN Willimantic Well 1

Technician: S.Pierpont, B.Buhler, T.Dowling

MAKE : Sensus SIZE : 6"

MODEL W-2000 SERIAL # 54516

REGISTER READING

BEFORE TEST 499,272,840 AFTER : 499,274,550

STATIC PRESS. 80psi REGISTER UNIT OF MEASURE Gallon

FLOW RATE IN GPM OR CU/FT	STOP	START	METER VOLUME	TESTER VOLUME	TESTER ACCURACY	TESTED METER ACCURACY %
480 GPM	**499274550**	**499272840**	**1710**	**3431.0**	**98.6**	**49.14**

REMARKS : Calculations (Meter Volume / Tester Volume) X Tester Accuracy = Tested Meter Accuracy

(1710 / 3431) X 98.6 = 49%

Tester Accuracy determined by the flow rate and the flow rate curve provided by Sensus

THE CONNECTICUT WATER COMPANY

Date : 1/16/2019 Time : 12:30am

Company Name: Connecticut Water Company

Meter Location : UCONN Willimantic Well 2

Technician: S.Pierpont, T.Dowling, B.Buhler

MAKE : Sparling SIZE : 8"

MODEL K483 SERIAL # 136072

REGISTER READING

BEFORE TEST 54,618,900 AFTER : 54,621,484

STATIC PRESS. 28psi REGISTER UNIT OF MEASURE Gallon

FLOW RATE IN GPM OR CU/FT	STOP	START	METER VOLUME	TESTER VOLUME	TESTER ACCURACY	TESTED METER ACCURACY %
270GPM	**54621484**	**54618900**	**2584**	**2545.0**	**99.2**	**100.72**

REMARKS : Calculations (Meter Volume / Tester Volume) X Tester Accuracy = Tested Meter Accuracy

(2584 / 2545) X 99.2 = 100.7

Tester Accuracy determined by the flow rate and the flow rate curve provided by Sensus

THE CONNECTICUT WATER COMPANY

Date : 1/16/2019 Time : 11am

Company Name: Connecticut Water Company

Meter Location : UCONN Willimantic Well 3

Technician: S.Pierpont, B.Buhler, T. Dowling

MAKE : Sensus SIZE : 6"

MODEL W-2000 SERIAL # 81073698

REGISTER READING

BEFORE TEST 204,374,529 AFTER : 204,380,800

STATIC PRESS. 50 PSI REGISTER UNIT OF MEASURE Gallon

FLOW RATE IN GPM OR CU/FT	STOP	START	METER VOLUME	TESTER VOLUME	TESTER ACCURACY	TESTED METER ACCURACY %
586 GPM	**204377940**	**204374520**	**3420**	**3580.0**	**98.6**	**94.19**
470 GPM	**204380800**	**204377964**	**2836**	**2654.0**	**98.6**	**105.36**

REMARKS : Calculations (Meter Volume / Tester Volume) X Tester Accuracy = Tested Meter Accuracy

(2836 / 2654) X 98.6 = 105%

Tester Accuracy determined by the flow rate and the flow rate curve provided by Sensus

THE CONNECTICUT WATER COMPANY

Date : 1/16/2019 Time : 10Am

Company Name: Connecticut Water Company

Meter Location : UCONN Willimantic Well 4

Technician: S.Pierpont, B. Buhler, T.Dowling

MAKE : Sensus SIZE : 6"

MODEL W-2000 SERIAL # 63006165

REGISTER READING

BEFORE TEST 944,562,290 AFTER : 944,570,610

STATIC PRESS. 35 PSI & 118 PSI REGISTER UNIT OF MEASURE Gallon

FLOW RATE IN GPM OR CU/FT	STOP	START	METER VOLUME	TESTER VOLUME	TESTER ACCURACY	TESTED METER ACCURACY %
623 GPM	**944567980**	**944563730**	**4250**	**3138.0**	**98.6**	**133.54**
308 GPM	**944570610**	**944568240**	**2370**	**2071.0**	**99.0**	**113.29**

REMARKS : Calculations (Meter Volume / Tester Volume) X Tester Accuracy = Tested Meter Accuracy

(2370 / 2071) X 99 = 113%

Tester Accuracy determined by the flow rate and the flow rate curve provided by Sensus

University of Connecticut

Utility Services Sub-Metering Design Standards

Storrs Campus

Campus Building Sub-Metering

All campus buildings larger than 20,000 gross square feet (GSF) provided utility services (Electric, Steam with Condensate Return, Chilled Water, Domestic Water, Reclaimed Water and Natural Gas) shall be equipped with utility service sub-metering. Utility service meter data shall be logged into UConn's GE IFIX Supervisory Control and Data Acquisition (SCADA) metering platform and stored in the existing OSIsoft PI Historian data server. For buildings smaller than 20,000 GSF, if existing utility service sub-meters are installed, Projects shall retain/improve existing metering as requested by the University's Facility Operations (FO) Metering Department.

Various topologies have existed at the University over the years for the collection of utility services sub-metering data at the building level. This standard supersedes all previous methodologies. Under no circumstances shall the Building Management System (BMS) be utilized as a conduit for sub-metering data unless approved by FO Director of Utility Operations or their delegate. In some cases, old BMS interfaces have long become obsolete with software updates no longer being supported by the vendor resulting in continued security issues. In all cases, meters shall be accessible via Modbus/TCP with gateways suitable for use in a multi-master topology. Baud rates shall not necessarily use the minimal default 9,600 bits per second (bps) but be as fast as possible given the physical layout of the system not to exceed 57,600 bps. Serial links shall use 8-bit no parity and 1-stop bit frames (8N1 serial) and, when possible, 4-wire full duplex serial communications. This topology shall provide access to direct reads of the meter registers. Under no circumstance shall in-direct measurements (i.e., pulse meters to integrators when the registers can be read directly if properly specified) be taken that will not directly reconcile the display to the internal registers on the meter unless approved by FO Director of Utility Operations or their delegate.

The peripheral areas of the Storrs campus may not obtain utility services from the Central Utility Plant (CUP) and Cogeneration Facility (Cogen). In those areas, the private utilities associated with those locations will be responsible for any required metering. For buildings larger than 20,000 GSF serviced by the local utility (i.e., not the University's CUP and Cogen), an output device to the University metering network may be required. The Project is responsible for obtaining, in writing, direction on properties larger than 20,000 GSF serviced by the local utility. Refer to the local Utility Providers enhanced metering services for more information on metering requirements. For Utility metering, additional raceway, such as to support phone lines, etc. for metering, may be required at the meter provisions. All UConn Eversource services typically fall under time of use rates which require a plain old telephone service connection (POTS). All local Utility Provider meters shall be installed exterior to the building unless approved by User Occupants and FO for third party access to equipment via key provided to the utility company. This key shall not be a general purpose University mechanical key, but a key as approved by the University Locksmith to limit access to the specific area.

For existing buildings acquired by the University and/or existing conditions of buildings currently owned and operated by the University, the Project shall follow the standards as described below. If for some reason these standards cannot be met, a written wavier shall be generated by the Project and approved by FO Metering Department to proceed with the non-standard design. To properly install utility service sub-metering, Factory Startup Services may be necessary to procure and, at a minimum, provide an allowance to engage our SCADA integration company, currently Array Systems, LLC (John Hodgson Johnh@arraysi.com, 203-627-0789), to map the meter into the GE IFIX SCADA metering platform and the PI Historian data server.

Domestic and Reclaimed Water

Domestic and reclaimed water sub-meters shall be in-line meters installed at the building service entrance on the primary line and shall utilize either positive displacement, differential pressure or velocity technology. Meters shall not be install on secondary lines. Insertion type meters are not acceptable for metering of utility services at the building service entrance. These meters shall monitor domestic or reclaimed water flow rate (GPM) and accumulated flow (gallons) for high and low flow conditions. Single meters with two registers for high and low flow are acceptable. Meters shall utilize solid state absolute encoder Automatic Meter Reading / Advanced Metering Infrastructure (AMR/AMI used interchangeably herein) style meters with integral accumulators and hardwired communications using proprietary serial format. AMR style registers using FCC licensed or unlicensed radio communications shall not be specified. However, in some cases the antennae can be removed to get the required serial link. Pulse meters connected to BMS components are not acceptable. however, pulse meters connected to manufacturer external accumulators with Modbus communications are acceptable provided suitable enclosures and Modbus gateways are provided to provide Modbus/TCP. Meter registers shall follow AMR/AMI Standard C707-05 for remote hardwired reads of 8 digit resolution minimally and shall be installed with C707-05 compatible Modbus/TCP interfaces reporting the accumulator and reporting flow. Flow may be derived from the accumulator but the accumulator in general shall not be derived from the flow. Registers shall require no external power to operate but may include integral batteries having a nominal life of 10 years minimally.

Acceptable manufacturers for meters and registers are as follows:

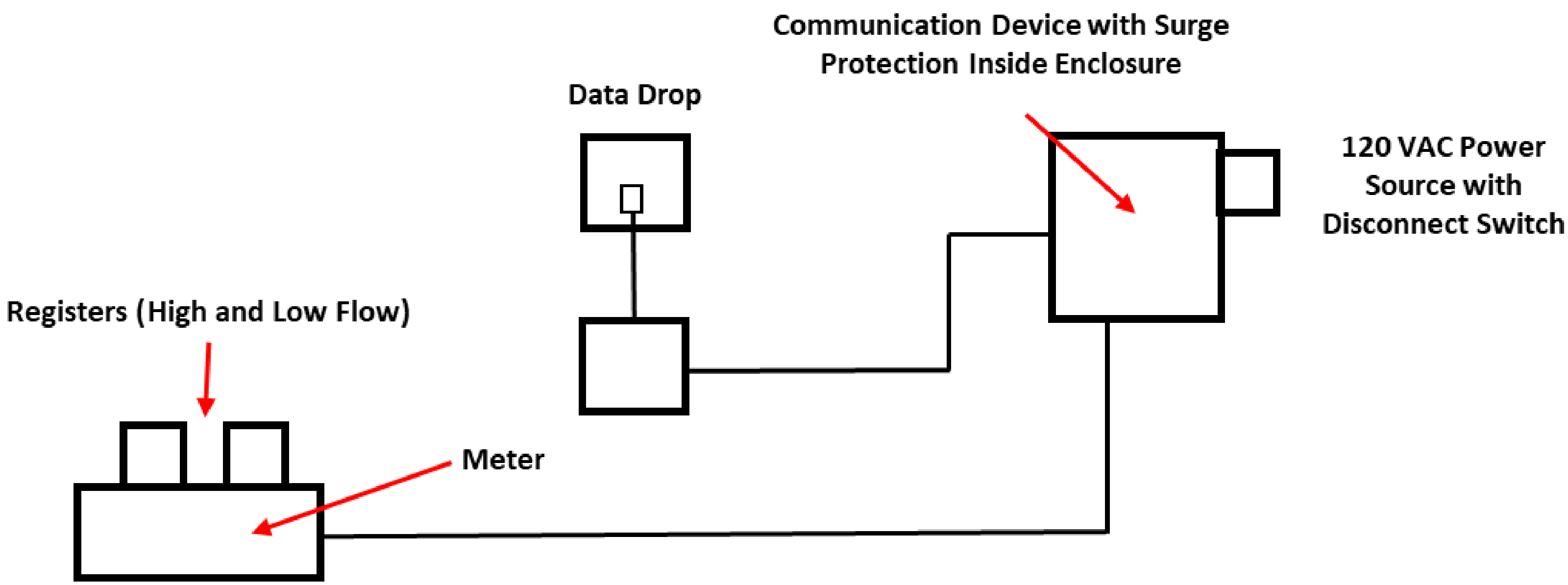
- Neptune utilizing E-Coder Plus compatible register, 8-digit serial remote read, Ethermeter for accumulator and flow Modbus/TCP reporting. Note one Ethermeter supports two meter registers for high/low flow. Contact manufacturer for other compatible gateways to the Scadametrics Ethermeter. SCADA gateway must support AWWA C707-05 communications and 8 digit minimal read resolution.

- Sensus Omni T2 series, or similar AWWA C707-05 compatible AMR meter register, with Ethermeter SCADA gateway like the Neptune meters described above.

- Utility Grade AMR meter with C707-05 compatible serial AMR read registers having 8 digit resolution minimally may be acceptable, with Ethermeter SCADA gateway like the Neptune meters described above. UConn utilizes Connecticut Water Company for service and we have strong desire to utilize meters they can service, support and test for us.

Installation and setup of meters shall comply with the manufacturer's instructions, including minimum pipe diameters before and after the meter, as required. Combined low flow and high flow meters with corresponding registers shall be installed for larger volumes that are highly variable. Other water meter configurations may only require a single meter and register. These meters shall be selected and sized to meet the minimum turndown ratio of 15:1 relative to the building's domestic or reclaimed water design capacity. Isolation valves shall be installed upstream and downstream of the meter for maintenance purposes. For velocity turbine-type high flow meter installations, a strainer shall be installed ahead of the meter location to prevent damage to the meter. Strainers are not required for other water meter technologies. Meters shall be installed before the backflow preventers. Meter registers shall be installed in an upright position. Ensure the selected meter location is accessible and allow for adequate clearance for meter assemblies as required by the meter manufacturer instructions. The location shall not exceed 6 feet above the finished floor as measured at the top of the meter assembly.

All domestic or reclaimed water meter devices shall communicate with the campus network via Modbus/TCP. Coordination with UConn's ITS department will be required to install a data drop near the meter location for Modbus/TCP communications. Domestic or reclaimed water meter instrumentation and communication devices will require the installation of 120 VAC power source near the meter location. Coordination with UConn Facilities Trade Services personnel or outside trade services contractor will be required for the installation of the power source. Coordination with Array Systems, LLC is required to program the meters into UConn's GE IFIX SCADA metering platform and PI Historian data server. The communication device shall be contained within an enclosure mounted on the wall near the meter, data drop and power source location. The communication device will require a surge protection device also contained within the enclosure. The 120 VAC power source will have a disconnect switch installed on the outside of the enclosure. If the 120 VAC disconnect switch is not readily and easily accessible to the meter location, a lockage disconnect switch must be installed. All wall mounted enclosures and meter peripherals should be mounted at approximately 6 feet from floor or as close as possible for serviceability.



As needed, combined high and low flow meters will be installed for larger volume, highly variable flows. Other water meter configurations may only require a single meter and register. Meters shall be installed in-line with pipe with isolation valves installed upstream and downstream of the meter. A strainer is required ahead of the meter location for velocity turbine-type high flow meters. Strainers are not required for other water meter technologies. Meters shall be installed before backflow preventers.

Domestic or Reclaimed Water Metering System Configuration (Aug. 2018)

APPENDIX M
Consumer Confidence Reports

2017 Water Quality Report

UCONN
UNIVERSITY OF CONNECTICUT

Main Campus, Storrs and Depot Campus, Mansfield
Public Water System ID No. CT 0780021

Delivering Quality Water

The University of Connecticut (UConn) is pleased to provide you, our water system customer, with the 2017 Water Quality Report. This report is provided to fulfill the Consumer Confidence Reporting requirement of the federal Safe Drinking Water Act (please see the water quality test results on page 3) and to keep you apprised of important water system developments.

We know how important it is to provide clean, safe drinking water each and every day so our consumers can trust the water being provided to them. The University and its contract operator, New England Water Utility Services (NEWUS), want to assure you that a number of steps are taken in our water treatment and testing so you can have confidence in your water quality.

UConn's 2017 Water Quality Report includes the results of more than 3,000 samples tested at state certified laboratories for more than 90 potential contaminants and water quality parameters. We are pleased to report the water quality results meet state and federal drinking water standards.

The UConn water system's primary sources of water to meet on-campus demands are the gravel-packed wells located near the streambanks of the Fenton and Willimantic rivers. Additionally, the University's well water can now be supplemented when needed with water from the Connecticut Water Company's (CWC) Northern-Western water system through an interconnection with our system which feeds into the University's tank at the entrance to campus on Route 195. As of December 2016, drinking water from the CWC system has been flowing to the UConn system to provide for the off-campus customers of Connecticut Water in Storrs.

Our wellfields provide groundwater that is of very high quality, and we treat the water with low doses of sodium hydroxide to adjust the pH to protect against corrosion. Further, we fully comply with the Federal Environmental Protection Agency (EPA) requirements regarding sampling for lead in drinking water and have provided documentation to the Connecticut Department of Public Health (DPH) to demonstrate our results.

Like UConn, Connecticut Water has comprehensive programs that provide treatment based on the source water quality. Extensive water quality testing is conducted at CWC's sources and within their distribution system and the water quality meets state and federal water quality standards.

In 2017, Connecticut Water completed construction of the new Rockville Drinking Water Treatment Facility. The investment in the new facility allows CWC to satisfy increasingly stringent water quality standards and environmental rules and meet current and future water supply needs for the 85,000 customers in 12 communities in this Northern-Western division as well as the University and customers in Mansfield and Willington now served from the facility.

We are pleased that the years of planning, permitting, and construction, have enabled the University to ensure an adequate quantity of pure drinking water while making efficient use of available resources.

Thank you for taking the time to review this report. If you have questions concerning the drinking water quality results, please call, week days between 8 a.m. and 5 p.m., the University's Department of Environmental Health and Safety at 860-486-3613, or the project manager at NEWUS, the contract operator subsidiary of CWC, at 860-486-1081.

Regulatory Oversight

To ensure that tap water is safe to drink, the EPA and the DPH establish and enforce regulations that limit the amount of certain substances in the water provided by public water systems.

Water quality testing is an ongoing process, and the frequency of testing for each parameter is prescribed by drinking water regulations. Due to testing schedules, not all of these tests were required during 2017, but the most recent test data is shown in the table located on page 3. Samples from the University's and CWC's water systems are tested regularly at state-certified laboratories to ensure compliance with state and federal water quality standards. Water samples are collected for water quality analysis from our wells, from entry points into our systems, and from sample locations within our distribution system.

Additional Water Supply Secured for the Long-Term

To plan for the anticipated long-term water supply needs of UConn and nearby areas in Mansfield, a detailed study in the form of an Environmental Impact Evaluation was prepared, publicly reviewed, and ultimately approved in 2013 under the state's Environmental Policy Act. Among the alternatives that were studied, an interconnection with CWC was determined to be the most environmentally sound, most consistent with the state plan of conservation and development, and most economical.

In June 2015, the University and Connecticut Water jointly received their permit from the Department of Energy and Environmental Protection (DEEP) approving the interconnection of the two supply systems and the construction of a pipeline to interconnect the UConn and CWC systems. The interconnection was completed with drinking water actively flowing from the CWC system as of December 2016.

Since water from the CWC interconnection is now part of the UConn system, the CWC system test results are incorporated in the new expanded water quality tables in this report.

CWC, working in partnership with the Town of Mansfield, established a Water System Advisory Group with representatives from the Town, UConn, nearby communities, and other stakeholders, who meet regularly to review local projects and ensure communication and collaboration relating to CWC's system. The group also makes recommendations about best management practices, including water conservation programs, and the company will work with the Advisory Committee to implement such programs.

University Water Towers

System Description

The University owns and operates the Main Campus water system in Storrs and the Depot Campus section in Mansfield. Although the Main and Depot systems are interconnected, the source of water within each system can vary.

The Main Campus receives water from gravel-packed wells located in the Fenton River and Willimantic River Wellfields. In addition, supplemental supplies are now available from CWC's Northern-Western system. The Depot Campus receives water only from the Willimantic River Wellfield. UConn's wells do not pump directly from the Fenton and Willimantic Rivers; rather, the wells are located near the rivers and pump groundwater from underground aquifers.

As groundwater moves very slowly through the fine sands that make up these aquifers, the water is naturally filtered. The result is water of excellent chemical, physical, and bacteriological quality pumped from each wellfield. The only water treatment added is sodium hydroxide for pH adjustment and corrosion control, and chlorine for disinfection.

The University continues to have an ample supply of high quality drinking water to meet the needs of its current on-campus and off-campus users. In addition, it has over 7.6 million gallons of water storage capacity to meet all domestic, process, and fire protection needs. Large booster pumps help maintain adequate system pressures, and emergency generator power ensures continued operation during electric power outages.

Water Quality

As water travels over the land surface and/or through the ground, it dissolves naturally occurring minerals and in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity, including:

- viruses and bacteria, which may come from septic systems, livestock and wildlife;
- salts and metals, which can be natural or may result from storm water runoff and farming;
- pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff or lawn care;
- organic chemicals, which originate from industrial processes, gas stations, storm water runoff and septic systems; and
- radioactive substances that can be naturally occurring.

To ensure safe tap water, EPA prescribes limits on these substances in water provided by public water systems. The presence of these contaminants does not mean that there is a health risk. The University complies with EPA and DPH water quality requirements to ensure the quality of the water delivered to consumers.

Stage 2 Disinfectants and Disinfection Byproduct Rule (Stage 2 DBP rule)

The EPA's Stage 2 Disinfectants and Disinfectants Byproducts Rule (DBPR) requires all water systems to evaluate for the potential for producing elevated levels of certain "disinfectant byproducts" that have potential adverse health effects. These chemical compounds can be produced by the reaction of disinfecting chemicals with naturally occurring chemical compounds found in the water.

Water quality test results over eight consecutive quarterly sampling periods showed that none of the samples contained levels of disinfection byproducts in excess of allowable levels. Because of these favorable sample results both the Depot and Main Campus water systems have been designated in compliance with the DBPR.

Health Information

Consumer Confidence Reports are required to contain public health information for certain contaminants and compounds, even if the levels detected in the system were less than the Maximum Contaminant Levels (MCL) established for those parameters. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk for infections. These people should seek advice about drinking water from their health care providers. EPA and the Federal Centers for Disease Control guidelines on reducing the risk of infection by Cryptosporidium and other microbial contaminants are available from EPA's Safe Drinking Water Hotline (800-426-4791).

COPPER & LEAD. The University currently meets regulatory requirements for both lead and copper. Lead and copper samples were collected in 2017. The 90th percentiles for both lead and copper were below the EPA Action Level. Nonetheless, the University believes it is important to provide its customers with the information regarding lead and copper. (see page four)

Water Quality Testing

The results of tests conducted on water samples for regulated compounds for our Main and Depot systems as well as information on the water from CWC's Northern-Western system are summarized in the following tables. While most of the monitoring was conducted in 2017, certain substances are monitored less than once per year because the concentrations are expected to be relatively constant. If levels were tested prior to 2017, the year is identified in parentheses.

As required by the EPA and the DPH, the University also periodically tests for "unregulated contaminants." Unregulated contaminants are those that do not yet have a drinking water standard set by EPA. The purpose of monitoring for these contaminants is to help EPA decide whether the contaminants should have a standard. The last required samples for those unregulated compounds were collected in October 2014 with all sample results below detection levels.

In addition, since UConn's water comes from groundwater wells and given our water system's treatment capabilities, UConn's water supply is newly subject to the DPH's "Ground Water Rule" requiring routine tests for e. coli bacteria. As of September 2016, UConn tests each active well on a monthly basis for the presence of e. coli. There have been no detections.

University of Connecticut Water System

The 2017 water test results include the results of the University's system and CWC's Northern-Western system interconnection. The interconnection began actively flowing in December 2016, at which time CWC became a supplemental source of supply for the University.

DISINFECTANT RESIDUAL								
Analyte	Unit	MRDL	MRDLG	Range of Detection Low	Range of Detection High	Sample Year	Met Drinking Water Standards	Typical Source
Chlorine	ppm	4	4	0.04	0.78	2017	Yes	Water additive used to control microbes

INORGANIC CHEMICALS								
Analyte	Unit	MCL	MCLG	Range of Detection Low	Range of Detection High	Sample Year	Met Drinking Water Standards	Typical Source
Arsenic	ppb	10	0	ND	2.5	2017	Yes	Erosion of natural deposits
Barium	ppm	2	2	0.019	0.297	2017	Yes	Erosion of natural deposits
Chloride	ppm	250	NA	17.4	86.8	2017	Yes	Erosion of natural deposits
Fluoride	ppm	4	4	ND	0.76	2017	Yes	Erosion of natural deposits
Nickel	ppb	100	100	ND	ND	2017	Yes	Erosion of natural deposits
Nitrate	ppm	10	10	0.08	7.46	2017	Yes	Runoff from fertilizer
Nitrite	ppm	1	1	ND	0.022	2017	Yes	Runoff from fertilizer
Selenium	ppb	50	50	ND	1	2017	Yes	Erosion of natural deposits
Sodium	ppm	NL=>28	NA	8.85	39.5	2017	Yes*	Erosion of natural deposits
Sulfate	ppm	NA	250	16.2	83.8	2017	Yes	Erosion of natural deposits

**** Sodium Notification***

During routine water quality testing in the UConn System, the results of one water quality sample indicated a sodium level of 39.5 ppm. The State of Connecticut has established a notification level of greater than 28 ppm for sodium in drinking water.

Further, Section 19-13-B102 of the State Public Health Code requires us to provide a notice to you if the sodium content exceeds 28 ppm. The reason for the notification is so that consumers on low or restricted sodium diets may take into account their sodium intake from the drinking water. If you have been placed on a sodium-restricted diet, please inform your physician that based on 2017 testing, your water contains 39.5 ppm of sodium. The University has reduced its distribution of salt during the winter storms by 32%.

Nitrate:

Connecticut Water Company's UConn System is in compliance with the EPA's standard of less than 10 ppm for nitrate in drinking water. However, you should know that a nitrate level in drinking water above 10 ppm is a health risk for infants less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you may want to ask for advice from your health care provider.

RADIONUCLIDES								
Analyte	Unit	MCL	MCLG	Range of Detection Low	Range of Detection High	Sample Year	Met Drinking Water Standards	Typical Source
Net Gross Alpha	pCi/L	15	0	ND	5.14	2017	Yes	Erosion of natural deposits
Combined Radium	pCi/L	5	0	ND	1.46	2017	Yes	Erosion of natural deposits
Uranium	ppb	30	0	ND	1.17	2017	Yes	Erosion of natural deposits
Radon	pCi/L	NA	NA	ND	1,692	2017	Yes	Erosion of natural deposits

What is Radon:

There is currently no federal drinking water standard for radon and it is not clear whether radon that is ingested (i.e. taken through the mouth) contributes to cancer or other adverse health conditions. EPA is considering a standard of no more than 4,000 pCi/L in water, though the final EPA standard may be different. As more information becomes available, Connecticut Water will take appropriate measures as may be necessary.

Radon is a colorless, tasteless, naturally occurring radioactive gas that may be present in rock, soil, groundwater and air. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can enter homes from tap water during showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will, in most cases, be a very small portion of the total radon in indoor air. Approximately only 1 part in 10,000 of radon in water will move into the air through these normal household activities.

If you are concerned about radon in your home, you may wish to test the air. Testing is inexpensive and easy. For additional information, call DPH at 860-509-7367 or EPA's Radon Hotline at 1-800-SOS-RADON.

MICROBIOLOGICAL							
Analyte	MCL	MCLG	Detected in Water System		Sample Year	Met Drinking Water Standards	Typical Source
Total Coliforms	Not to exceed 5% of monthly samples	0	Absent		2017	Yes	Naturally present in environment
E. coli		0	Absent		2017	Yes	
Turbidity	TT >5 NTU	0	ND	7.75	2017	No	Soil runoff
Total Organic Carbon	TT (compliance ratio ≥1)	0	Compliance Ratio = 1.5		2017	Yes	Naturally present in environment

Turbidity:

Turbidity has no health effects, however, it can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

Monitoring and Reporting Violation

Our public water system recently incurred a violation for monitoring and reporting water quality results. As a supplier of public drinking water, we are required to monitor the water quality of our water supply for specific contaminants on a regular basis to ensure that it meets the current drinking water standards. Failure to conduct monitoring and/or report results of such monitoring to the State DPH Drinking Water Section constitutes a violation. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did to correct this situtation. For the month of September, we were required to collect 30 samples for total coliform, chlorine and physical parameters and report the results to the Department of Public Health. Only 29 of the 30 required samples for that month were collected. All subsequent monthly monitoring has been conducted and as of October 2017, the system has been in full compliance.

DISINFECTION BYPRODUCTS									
Analyte	Unit	MCL	MCLG	Range of Detection		LRAA	Sample Year	Met Drinking Water Standards	Typical Source
				Low	High				
Total Trihalomethanes	ppb	80	NA	6.67	57.7	19.34	2017	Yes	By-product of drinking water disinfection
Haloacetic Acids	ppb	60	NA	ND	25.2	5.88	2017	Yes	By-product of drinking water disinfection

LEAD AND COPPER									
Analyte	Unit	MCL	MCLG	Range of Detection		90th %ile value	Sample Year	Met Drinking Water Standards	Typical Source
				Low	High				
Lead	ppb	AL = 15	0	ND	3.8	1.0	2017	Yes	Corrosion of household plumbing systems
All 30 lead samples were **BELOW** Action Level.									
Copper	ppm	AL = 1.3	1.3	0.004	0.184	0.122	2017	Yes	Corrosion of household plumbing systems

Educational Information about Lead and Copper:

The University of Connecticut believes it is important to provide you with information about the sources of lead and copper in drinking water and the health effects associated with them. The primary source of lead and copper in tap water is household plumbing, and plumbing can vary from house to house within the same neighborhood. For information on the levels of lead and copper detected in your drinking water system, please refer to the table above.

What is lead:

Major sources of lead in drinking water are corrosion of household plumbing systems and erosion of natural deposits. Health Effects: Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink water containing lead in excess of the action level over many years could develop kidney problems or high blood pressure.

What is copper:

Major sources of copper in drinking water are corrosion of household plumbing systems, erosion of natural deposits, and leaching from wood preservatives. Health Effects: Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. Anyone with Wilson's Disease should consult their personal doctor.

If you are concerned about elevated lead or copper levels, you may wish to have your water tested. Running your tap for 30 seconds to two minutes before use will significantly reduce the levels of lead and copper in the water. Additional information is available from the U.S. EPA Safe Drinking Water Hotline at 1-800-426-4791.

UNREGULATED CONTAMINANT MONITORING RULE 3 (UCMR 3)

EPA continually evaluates its drinking water standards to protect public health. As required by the 1996 Safe Drinking Water Act amendments, once every five years EPA issues a new list of no more than 30 unregulated contaminants to be monitored by public water systems. This monitoring provides a basis for potential future regulatory actions to protect public health.

Connecticut Water conducted the required sampling and analysis between 2013 -2014 under the UCMR 3. The table below shows which of the unregulated contaminants were detected:

UCMR 3 parameters have no standards and are being evaluated for potential future regulation		
Contaminant	**Range**	**Likely Source of Contamination**
Chlorate (ppb)	ND - 110	By-product of drinking water disinfection
Chromium (ppb)	ND - 0.37	Erosion of natural deposits
Hexavalent Chromium (ppb)	ND - 0.32	Erosion of natural deposits
Molybdenum (ppb)	ND - 2.6	Erosion of natural deposits
Strontium (ppb)	ND - 240	Erosion of natural deposits
Vanadium (ppb)	ND - 2.6	Erosion of natural deposits
Radon (pCi/L)	ND - 1856	Erosion of natural deposits

TERMS AND ABBREVIATIONS

AL = Action Level: The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

LRAA = Locational Running Annual Average: The average of sample analytical results for samples taken at a particular monitoring location during the previous 4 calendar quarters. The LRAA is used for direct comparison to the MCL.

MCL = Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG = Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MRDL = Maximum Residual Disinfectant Level: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG = Maximum residual disinfectant Level Goal: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control micribial contamination.

NA = Not Applicable

ND = Not Detected

NL = Notification Level: There is no MCL for sodium. However, the Connecticut Department of Public Health requires that customers be notified if sodium levels exceed 28 ppm.

NTU = Nephelometric Turbidity Unit: A measure of water clarity.

ppm = parts per million, or milligrams per liter (mg/L) This is equivalent to one second in 11.5 days.

ppb = parts per billion, or micrograms per liter (μg/L) This is equivalent to one second in 32 years.

ppt = parts per trillion, or nanograms per liter (ng/L) This is equivalent to one second in 32,000 years.

pCi/L = picocuries per liter (a measure of radioactivity)

TT = Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

90^{th} %ile = 90^{th} percentile value: The calculated value that is equal to or greater than 90 percent of the individual sample concentrations for the water system. The 90^{th} percentile value is used for direct comparison to the AL.

Special Considerations:

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Center of Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Managing Demand

Over the past 10+ years, UConn has made major investments in leak detection and repair in order to reduce water losses from our transmission and distribution systems. Also, extensive outreach continues to be done to inform our students, staff, and off-campus customers of the importance of water conservation. During much of that time the result of these investments and efforts had been a year-to-year reduction in water use, or at least sustained levels of water use, despite the fact that the service population was growing little-by-little.

The most notable reduction in potable water demand was the result of the University's Reclaimed Water Facility (RWF). Since the summer of 2013, the RWF has provided treated non-potable water to UConn's utility plant for make-up water for steam production, process cooling for the heat-and-power producing turbines, and chilled water used for air conditioning in many campus buildings.

The reclaimed water facility produced 319,962 gallons per day (gpd) on average in 2017. The RWF and utility plant staff are constantly looking for ways to improve the efficiency and effectiveness of reclaimed water production. In fact, a process change suggested by plant staff in early 2015 significantly cut the salt concentration in the reclaimed water, which increased its usage as process water. Additionally, reclaimed water was used in lieu of potable water in a process at the wastewater treatment plant.

Several building projects currently under construction also use reclaimed water. The Tech Park's Innovation Partnership Building, and the science and engineering building use reclaimed water for toilet flushing and meeting their cooling needs. By substituting processed wastewater for drinking water for these uses, the University expects to save at least 44,000 gpd of potable water during the cooling season.

Innovative Partnership Building on Discovery Drive

UConn has ambitions to further reduce our potable water usage through other reclaimed water applications, namely irrigation. UConn has been collaboratively working with DEEP and DPH on a permitting strategy. A permit package is being drafted and we are hopeful it will be in place for the 2019 irrigation season.

Emergency Notification

UConn and its contract operator, NEWUS, have established a notification system to alert its customers of water supply interruptions. These notifications will be sent when water is planned to be temporarily unavailable due to construction or other improvements or during emergencies such as a broken water main. UConn on-campus consumers are notified through the Building & Emergency Contact (B&EC) system. This enables an email to be sent to the listed contacts of the buildings expected to be affected by the outage. Off-campus customers are notified through NEWUS' emergency notification system. Notifications will include as much information as possible, including the expected duration of the outage, if known, and any special instructions.

In order for us to promptly notify our customers, it is important that our contact information for you is complete and up to date. Employees can check their B&EC contact information by accessing www.beclist.uconn.edu using their NET ID. Off-campus customers who wish to update their contact information, please call 1-800-286-5700, send an email to customerservice@ctwater.com, or visit www.ctwater.com/notification.

Reliability

In 2017, UConn started the third phase of the North Eagleville Road area infrastructure repair/replacement and upgrade project.

Approximately 1,060 linear feet of new 12-inch diameter water distribution pipe was installed on North Eagleville Road. Portions of this water main were over 100 years old and, as such, it was considered a critical upgrade.

New Well Screen Being Installed

The interconnection with CWC provides immediate redundancy to the University water system, UConn's existing sources of water will continue to be its primary source of supply. To ensure that the water system remains reliable, the Fenton River storage tank was inspected and necessary repairs were made in October 2017.

Additionally, the water system (tanks, pumps, equipment, etc.) will be included in UConn's new asset management system to assist with reliability and preventative maintenance.

A comprehensive leak detection and fire hydrant survey was completed in September 2017 and concluded that there were no damaged hydrants or system leaks found during the inspection.

Source Protection

The University actively protects its wells, wellfields, and the Fenton and Willimantic Rivers, which are valuable water resources. Pursuant to the Connecticut Environmental Policy Act (CEPA), the University undertakes Environmental Impact Evaluations for construction projects based on their size, location, cost or other factors. This process, administered through the State Office of Policy and Management (OPM), provides state agencies, the town of Mansfield, environmental organizations, and interested citizens an opportunity to participate in the review process on a project regarding its potential environmental impact. The University also cooperates with Windham Water Works regarding watershed inspections on the Main Campus. These inspections are designed to protect the Fenton River Wellfield and the Fenton River, as well as the downstream reservoir that serves the Windham Water system.

Willimantic River

The University utilizes its aquifer mapping information to delineate the areas of groundwater recharge for its wellfields. This technical evaluation, required by DEEP, shows the critical areas of direct recharge that must be protected from certain development. DPH, in conjunction with DEEP, maintains Source Water Assessment Program (SWAP) reports on the Fenton River and Willimantic River wells. These reports evaluate potential threats of contamination to our wells. The University's wellfields have an Overall Susceptibility Rating of "LOW," the best possible rating. To ensure continued source protection, however, the University will remain vigilant in protecting all of its water supply sources in the years to come. For more information regarding the SWAP report, visit the DPH's Web site at www.ct.gov/dph.

Water Usage

Overall, the total potable water usage in 2017 decreased compared to 2016 likely due to a slight decrease in growth in service population. From 2005 to 2017, the average daily demand on the UConn water system has decreased from 1.49 million gallon per day (mgd) to .89 mgd. While the on-campus service population increased by 16.7 percent over that time, the average daily water demand decreased by approximately 40 percent.

To accomplish that reduction, the University made many water system changes to the actual infrastructure and its operations, which has helped to increase our overall water use efficiency. We continue to build on the progress made in previous years by renewing our program to replace water fixtures in campus buildings with water-saving devices, and the University remains diligent about reducing wasted water through routine leak detection and repair.

Over the years, several of the campus's older buildings had been renovated with water-conserving fixtures. However, a robust program to retrofit fixtures in all buildings began in earnest in 2014 and continued throughout 2015. All residence halls faucet aerators and shower heads had been replaced with low flow fixtures, and we've witnessed a reduction of as much as 50,000 gallons per day as a result. As toilets are also addressed with more efficient replacements, the University expects to see further reductions in its peak day water demand.

In addition to reclaimed water and other improvements made to the water system, the cooperation from our consumers about conserving water certainly helped contribute to our overall drop in water usage. The summer and fall months of 2017 were particularly dry, and the resulting lower streamflows led to our requests for voluntary water conservation. We appreciate your efforts to conserve water when we issue our conservation requests and throughout the year.

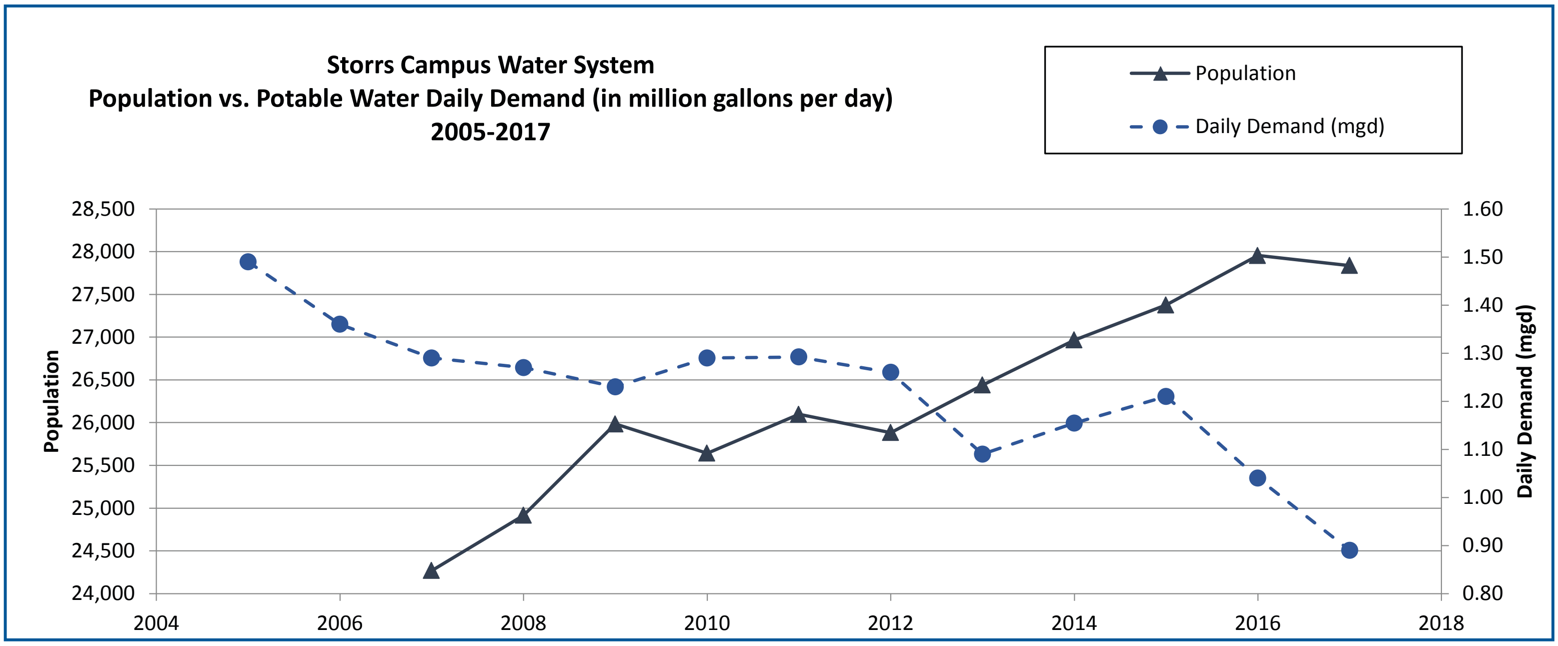
Water Conservation

While our water system does not pump water directly from the local rivers, it does extract groundwater from local aquifers that help sustain them. Extended dry weather naturally reduces streamflow which, in turn, may stress fish and other biotic stream habitat. That's why we respond with conservation measures of our own and request our customers to conserve water during these periods. UConn and NEWUS appreciate your cooperation and encourage the wise and efficient use of water at all times by applying the following tips:

- Install water-efficient fixtures and equipment, such as water-saving shower heads and toilets.
- Take shorter showers.
- Turn off faucets and showers when not in use.
- Wash full loads in washing machines/dishwashers.
- Limit running water in food preparation.
- Limit outdoor watering to early mornings or evenings, and do not water on windy days.
- Mulch around plants to reduce evaporation.
- Limit running water time when washing a car, or use a car wash.

Repair leaks:

- In UConn dorms, promptly report leaks to your Resident Advisor.
- In other campus buildings, to report leaks to Facilities Operations, use mobility through AIM or the myuconn app or call 860-486-3113.



University of Connecticut
Facilities Operation Building
25 LeDoyt Road, Unit 3252
Storrs, CT 06269

2017
Annual Water Quality Report

Proudly Presented By

2018 Water Quality Report

Main Campus, Storrs and Depot Campus, Mansfield
Public Water System ID No. CT 0780021

UCONN
UNIVERSITY OF CONNECTICUT

Delivering Quality Water

The University of Connecticut (UConn) is pleased to provide you, our water system customer, with the 2018 Water Quality Report. This report is provided to fulfill the Consumer Confidence Reporting requirement of the federal Safe Drinking Water Act (please see the water quality test results on page 3) and to keep you apprised of important water system developments.

We know how important it is to provide clean, safe drinking water each and every day so our consumers can trust the water being provided to them. The University and its contract operator, New England Water Utility Services (NEWUS), want to assure you that a number of steps are taken in our water treatment and testing so you can have confidence in your water quality.

UConn's 2018 Water Quality Report includes the results of more than 3,500 samples tested at state certified laboratories for more than 90 potential contaminants and water quality parameters. We are pleased to report the water quality results meet state and federal drinking water standards.

The UConn water system's primary sources of water to meet on-campus demands are the gravel-packed wells located near the streambanks of the Fenton and Willimantic rivers. Additionally, the University's well water can now be supplemented as needed with water from the Connecticut Water Company's (CWC) Northern-Western water system through an interconnection which feeds into the University's tank at the entrance to campus on Route 195.

Our wellfields provide groundwater that is of very high quality, and we treat the water with low doses of sodium hydroxide to adjust the pH to protect against corrosion. Further, we fully comply with the Federal Environmental Protection Agency (EPA) requirements regarding sampling for lead in drinking water and have provided documentation to the Connecticut Department of Public Health (DPH) to demonstrate our results.

Like UConn, CWC has comprehensive programs that provide treatment based on the source water quality. Extensive water quality testing is conducted at CWC's sources and within their distribution system and the water quality meets state and federal water quality standards.

In 2018, Connecticut Water completed construction of the new Rockville Drinking Water Treatment Facility. The investment in the new facility allows CWC to satisfy increasingly stringent water quality standards and environmental rules and meet current and future water supply needs for the 85,000 customers in 12 communities in this Northern-Western division as well as the University and customers in Mansfield and Willington now served from the facility.

We are pleased that the years of planning have enabled the University to ensure an adequate quantity of pure drinking water while making efficient use of available resources.

Thank you for taking the time to review this report. If you have questions concerning the drinking water quality results, please call, week days between 8 a.m. and 5 p.m., the University's Facilities Operations Center at 860-486-3113, or the project manager at NEWUS, the contract operator subsidiary of CWC, at 860-486-1081.

Regulatory Oversight

To ensure that tap water is safe to drink, the EPA and the DPH establish and enforce regulations that limit the amount of certain substances in the water provided by public water systems.

Water quality testing is an ongoing process, and the frequency of testing for each parameter is prescribed by drinking water regulations. Samples from the University's and CWC's water systems are tested regularly at state-certified laboratories to ensure compliance with state and federal water quality standards. Water samples are collected for water quality analysis from our wells, from entry points into our systems, and from sample locations within our distribution system. Due to testing schedules, not all of these tests were required during 2018, but the most recent test data is shown in the table located on page 3.

Meeting the Water Supply Needs of the Area

The University continues to have an ample supply of high quality drinking water to meet the needs of its current on-campus and off-campus users. In addition, it has over 7.6 million gallons of water storage capacity to meet all domestic, process, and fire protection needs. Large booster pumps help maintain adequate system pressures, and emergency generator power ensures continued operation during electric power outages.

A Water System Advisory Group with representatives from the Town, UConn, nearby communities, and other stakeholders, meets regularly to review local projects and ensure communication and collaboration relating to CWC's system and requests for water service in the area. The group also makes recommendations about best management practices, including water conservation programs, and the company works with the Advisory Committee to implement such programs.

University Water Towers

System Description

The University owns and operates the Main Campus water system in Storrs and the Depot Campus section in Mansfield. Although the Main and Depot systems are interconnected, the source of water within each system can vary.

The Main Campus receives water from gravel-packed wells located in the Fenton River and Willimantic River Wellfields. In addition, supplemental supplies are now available from CWC's Northern-Western system. The Depot Campus receives water only from the Willimantic River Wellfield. UConn's wells do not pump directly from the Fenton and Willimantic Rivers; rather, the wells are located near the rivers and pump groundwater from underground aquifers.

As groundwater moves very slowly through the fine sands that make up these aquifers, the water is naturally filtered. The result is water of excellent chemical, physical, and bacteriological quality pumped from each wellfield. The only water treatment added is sodium hydroxide for pH adjustment and corrosion control, and chlorine for disinfection.

Water Quality

As water travels over the land surface and/or through the ground, it dissolves naturally occurring minerals and in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity, including:

- viruses and bacteria, which may come from septic systems, livestock and wildlife;
- salts and metals, which can be natural or may result from storm water runoff and farming;
- pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff or lawn care;

- organic chemicals, which originate from industrial processes, gas stations, storm water runoff and septic systems; and
- radioactive substances that can be naturally occurring.

To ensure safe tap water, EPA prescribes limits on these substances in water provided by public water systems. The presence of these contaminants does not mean that there is a health risk. The University complies with EPA and DPH water quality requirements to ensure the quality of the water delivered to consumers.

The distribution system is flushed periodically throughout the year to remove both air and naturally occurring minerals from the mains, helping to maintain and improve water quality. This scheduled system maintenance is a part of the efforts to deliver the best possible water quality.

Stage 2 Disinfectants and Disinfection Byproduct Rule (Stage 2 DBP rule)

The EPA's Stage 2 Disinfectants and Disinfectants Byproducts Rule (DBPR) requires all water systems to evaluate for the potential for producing elevated levels of certain "disinfectant byproducts" that have potential adverse health effects. These chemical compounds can be produced by the reaction of disinfecting chemicals with naturally occurring chemical compounds found in the water.

Water quality test results over eight consecutive quarterly sampling periods showed that none of the samples contained levels of disinfection byproducts in excess of allowable levels. Because of these favorable sample results both the Depot and Main Campus water systems have been designated in compliance with the DBPR.

Health Information

Consumer Confidence Reports are required to contain public health information for certain contaminants and compounds, even if the levels detected in the system were less than the Maximum Contaminant Levels (MCL) established for those parameters. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk for infections. These people should seek advice about drinking water from their health care providers. EPA and the Federal Centers for Disease Control guidelines on reducing the risk of infection by Cryptosporidium and other microbial contaminants are available from EPA's Safe Drinking Water Hotline (800-426-4791).

COPPER & LEAD. The University currently meets regulatory requirements for both lead and copper. Lead and copper samples were collected in 2017. The 90th percentiles for both lead and copper were below the EPA Action Level. Nonetheless, the University believes it is important to provide its customers with the information regarding lead and copper. (see page four)

Water Quality Testing

The results of tests conducted on water samples for regulated compounds for our Main and Depot systems as well as information on the water from CWC's Northern-Western system are summarized in the following tables. While most of the monitoring was conducted in 2018, certain substances are monitored less than once per year because the concentrations are expected to be relatively constant. If levels were tested prior to 2018, the year is identified in parentheses.

As required by the EPA and the DPH, the University also periodically tests for "unregulated contaminants." Unregulated contaminants are those that do not yet have a drinking water standard set by EPA. The purpose of monitoring for these contaminants is to help EPA decide whether the contaminants should have a standard. The last required samples for those unregulated compounds were collected in October 2014 with all sample results below detection levels.

In addition, since UConn's water comes from groundwater wells and given our water system's treatment capabilities, UConn's water supply is newly subject to the DPH's "Ground Water Rule" requiring routine tests for e. coli bacteria. As of September 2016, UConn tests each active well on a monthly basis for the presence of e. coli. There have been no detections.

University of Connecticut Water System

The 2018 water test results include the results of the University's system and CWC's Northern-Western system interconnection. The interconnection began actively flowing in December 2016, at which time CWC became a supplemental source of supply for the University.

DISINFECTANT RESIDUAL								
Analyte	Unit	MRDL	MRDLG	Range of Detection Low	Range of Detection High	Sample Year	Met Drinking Water Standards	Typical Source
Chlorine	ppm	4	4	0.01	0.87	2018	Yes	Water additive used to control microbes

INORGANIC CHEMICALS								
Analyte	Unit	MCL	MCLG	Range of Detection Low	Range of Detection High	Sample Year	Met Drinking Water Standards	Typical Source
Arsenic	ppb	10	0	ND	ND	2018	Yes	Erosion of natural deposits
Barium	ppm	2	2	0.019	0.407	2018	Yes	Erosion of natural deposits
Chloride	ppm	250	NA	12	74.4	2018	Yes	Erosion of natural deposits
Fluoride	ppm	4	4	ND	0.72	2018	Yes	Erosion of natural deposits
Nitrate	ppm	10	10	0.085	0.899	2018	Yes	Runoff from fertilizer
Nitrite	ppm	1	1	ND	ND	2018	Yes	Runoff from fertilizer
Selenium	ppb	50	50	ND	ND	2018	Yes	Erosion of natural deposits
Sodium	ppm	NL=>28	NA	12.2	26.3	2018	Yes	Erosion of natural deposits
Sulfate	ppm	NA	250	6.2	75	2018	Yes	Erosion of natural deposits

Nitrate:

The University of Connecticut is in compliance with the EPA's standard of less than 10 ppm for nitrate in drinking water. However, you should know that a nitrate level in drinking water above 10 ppm is a health risk for infants less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you may want to ask for advice from your health care provider.

RADIONUCLIDES								
Analyte	Unit	MCL	MCLG	Range of Detection Low	Range of Detection High	Sample Year	Met Drinking Water Standards	Typical Source
Net Gross Alpha	pCi/L	15	0	ND	ND	2018	Yes	Erosion of natural deposits
Combined Radium	pCi/L	5	0	ND	ND	2018	Yes	Erosion of natural deposits
Uranium	ppb	30	0	ND	ND	2018	Yes	Erosion of natural deposits
Radon	pCi/L	NA	NA	235	235	2018	Yes	Erosion of natural deposits

What is Radon:

There is currently no federal drinking water standard for radon and it is not clear whether radon that is ingested (i.e. taken through the mouth) contributes to cancer or other adverse health conditions. EPA is considering a standard of no more than 4,000 pCi/L in water, though the final EPA standard may be different. As more information becomes available, the University of Connecticut will take appropriate measures as may be necessary.

Radon is a colorless, tasteless, naturally occurring radioactive gas that may be present in rock, soil, groundwater and air. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can enter homes from tap water during showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will, in most cases, be a very small portion of the total radon in indoor air. Approximately only 1 part in 10,000 of radon in water will move into the air through these normal household activities. If you are concerned about radon in your home, you may wish to test the air. Testing is inexpensive and easy. For additional information, call DPH at 860-509-7367 or EPA's Radon Hotline at 1-800-SOS-RADON.

MICROBIOLOGICAL							
Analyte	MCL	MCLG	Detected in Water System		Sample Year	Met Drinking Water Standards	Typical Source
Total Coliforms	Not to exceed 5% of monthly samples **		Absent		2018	Yes	Naturally present in environment
E. coli	See below †	0	Absent		2018	Yes	
Turbidity	TT >5 NTU	0	ND	9.43	2018	Yes	Soil runoff
Total Organic Carbon	TT (compliance ratio ≥1)	0	Compliance Ratio = 1.5		2018	Yes	Naturally present in environment

***** Total Coliform***

This report reflects compliance with the Revised Total Coliform Rule (RTCR) issued April 1, 2016. The RTCR requires water systems to continue to monitor for coliform contamination, and replaced the monthly MCL for total coliform with a TT for total coliform. The TT dictates that when coliform contamination exceeds a specified frequency, water systems must conduct an assessment of the system to identify and correct any potential routes of contamination in order to remain in compliance with Drinking Water Standards.

† *E. coli*

Any routine sample that shows the presence of total coliform triggers repeat samples that must be analyzed for total coliform and *E. coli* . If *E. coli* is found in any repeat sample, the system is considered to be in violation of the MCL.

Turbidity

Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

DISINFECTION BYPRODUCTS									
				Range of Detection					
Analyte	Unit	MCL	MCLG	Low	High	LRAA	Sample Year	Met Drinking Water Standards	Typical Source
Total Trihalomethanes	ppb	80	NA	6.8	45.1	29.03	2018	Yes	By-product of drinking water disinfection
Haloacetic Acids	ppb	60	NA	ND	21.9	7.2	2018	Yes	By-product of drinking water disinfection

LEAD AND COPPER									
				Range of Detection					
Analyte	Unit	MCL	MCLG	Low	High	90^{th} %ile value	Sample Year	Met Drinking Water Standards	Typical Source
Lead	ppb	AL = 15	0	ND	3.8	1.0	2017	Yes	Corrosion of household plumbing systems
All 30 lead samples were BELOW Action Level.									
Copper	ppm	AL = 1.3	1.3	0.004	0.184	0.122	2017	Yes	Corrosion of household plumbing systems

Educational Information about Lead and Copper:

The University of Connecticut believes it is important to provide you with information about the sources of lead and copper in drinking water and the health effects associated with them. The primary source of lead and copper in tap water is household plumbing, and plumbing can vary from house to house within the same neighborhood. For information on the levels of lead and copper detected in your drinking water system, please refer to the table above.

What is lead:

Major sources of lead in drinking water are corrosion of household plumbing systems and erosion of natural deposits. Health Effects: Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink water containing lead in excess of the action level over many years could develop kidney problems or high blood pressure. If present, elevated levels of lead can cause serious health problems, especially for pregnant woman and young children. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, please contact Facilities Operations Center at 860-486-3113 or the project manager at NEWUS, at 860-486-1081. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline 1-800-426-4791 or website https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-hotline or www.epa.gov/safewater/lead.

What is copper:

Major sources of copper in drinking water are corrosion of household plumbing systems, erosion of natural deposits, and leaching from wood preservatives. Health Effects: Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. Anyone with Wilson's Disease should consult their personal doctor. If you are concerned about elevated lead or copper levels, you may wish to have your water tested. Running your tap for 30 seconds to two minutes before use
will significantly reduce the levels of lead and copper in the water. Additional information is available from the U.S. Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791 or at https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-hotline.

If you are concerned about lead in your water, please contact Facilities Operations Center at 860-486-3113 or the project manager at NEWUS, at 860-486-1081. Running your tap for 30 seconds to two minutes before use will significantly reduce the levels of lead and copper in the water. Additional information is available from the U.S. Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

UNREGULATED CONTAMINANT MONITORING RULE 3 (UCMR 3)

EPA continually evaluates its drinking water standards to protect public health. As required by the 1996 Safe Drinking Water Act amendments, once every five years EPA issues a new list of no more than 30 unregulated contaminants to be monitored by public water systems. This monitoring provides a basis for potential future regulatory actions to protect public health.

The University conducted the required sampling and analysis between 2013 -2014 under the UCMR 3. The table below shows which of the unregulated contaminants were detected:

UCMR 3 parameters have no standards and are being evaluated for potential future regulation		
Contaminant	Range	Likely Source of Contamination
Chlorate (ppb)	ND - 110	By-product of drinking water disinfection
Chromium (ppb)	ND - 0.37	Erosion of natural deposits
Hexavalent Chromium (ppb)	ND - 0.32	Erosion of natural deposits
Molybdenum (ppb)	ND - 2.6	Erosion of natural deposits
Strontium (ppb)	ND - 240	Erosion of natural deposits
Vanadium (ppb)	ND - 2.6	Erosion of natural deposits
Radon (pCi/L)	ND - 1856	Erosion of natural deposits

TERMS AND ABBREVIATIONS
AL = Action Level: The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.
LRAA = Locational Running Annual Average: The average of sample analytical results for samples taken at a particular monitoring location during the previous 4 calendar quarters. The LRAA is used for direct comparison to the MCL.
MCL = Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MCLG = Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
MRDL = Maximum Residual Disinfectant Level: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG = Maximum residual disinfectant Level Goal: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control micribial contamination.
NA = Not Applicable
ND = Not Detected
NL = Notification Level: There is no MCL for sodium. However, the Connecticut Department of Public Health requires that customers be notified if sodium levels exceed 28 ppm.
NTU = Nephelometric Turbidity Unit: A measure of water clarity.
ppm = parts per million, or milligrams per liter (mg/L) This is equivalent to one second in 11.5 days.
ppb = parts per billion, or micrograms per liter (µg/L) This is equivalent to one second in 32 years.
ppt = parts per trillion, or nanograms per liter (ng/L) This is equivalent to one second in 32,000 years.
pCi/L = picocuries per liter (a measure of radioactivity)
TT = Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
90^{th} %ile = 90^{th} percentile value: The calculated value that is equal to or greater than 90 percent of the individual sample concentrations for the water system. The 90^{th} percentile value is used for direct comparison to the AL.

Special Considerations:

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Center of Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Managing Demand

Over the past 10+ years, UConn has made major investments in leak detection and repair in order to reduce water losses from our transmission and distribution systems. Also, extensive outreach continues to be done to inform our students, staff, and off-campus customers of the importance of water conservation. During much of that time the result of these investments and efforts had been a year-to-year reduction in water use, or at least sustained levels of water use, despite the fact that the service population was growing little-by-little.

The most notable reduction in potable water demand was the result of the University's Reclaimed Water Facility (RWF). Since the summer of 2013, the RWF has provided treated non-potable water to UConn's utility plant for make-up water for steam production, process cooling for the heat-and-power producing turbines, and chilled water used for air conditioning in many campus buildings.

Additionally, reclaimed water was used in lieu of potable water in a process at the wastewater treatment plant. The reclaimed water facility produced 301,112 gallons per day (gpd) on average in 2018.

Several building projects currently under construction also use reclaimed water. The Tech Park's Innovation Partnership Building and Engineering Science Building use reclaimed water for toilet flushing and meeting their cooling needs. By substituting processed wastewater for drinking water for these uses, the University expects to save at least 44,000 gpd of potable water during the cooling season.

Innovative Partnership Building on Discovery Drive

UConn has ambitions to further reduce our potable water usage through other reclaimed water applications, namely irrigation. UConn has been collaboratively working with DEEP and DPH on a permitting strategy. A permit package is being drafted and we are hopeful it will be in place for the 2020 irrigation season. An ongoing effort to repair/replace steam and condensate return pipe has also shown a water savings at the University's Central Utility Plant.

Emergency Notification

UConn and its contract operator, NEWUS, have established a notification system to alert its customers of water supply interruptions. These notifications will be sent when water is planned to be temporarily unavailable due to construction or other improvements or during emergencies such as a broken water main. UConn on-campus consumers are notified through the Building & Emergency Contact (B&EC) system. This enables an email to be sent to the listed contacts of the buildings expected to be affected by the outage. Off-campus customers are notified through CWC's emergency notification system. Notifications will include as much information as possible, including the expected duration of the outage, if known, and any special instructions.

In order for us to promptly notify our customers, it is important that our contact information for you is complete and up to date. Employees can check their B&EC contact information by accessing www.beclist.uconn.edu using their NET ID. Off-campus customers who wish to update their contact information, please call 1-800-286-5700, send an email to customerservice@ctwater.com, or visit www.ctwater.com/notification.

Infrastructure Investment and Reliability

As part of our commitment to maintaining water quality and service, we committed over $274,000 to water system improvements in 2018. These expenditures have funded upgrades to the wells, storage and distribution with the following improvements made in 2018:

- Installation of seven insertion valves. These valves will help to minimize future shutdowns during emergency repairs.
- Two of the four Willimantic wells were inspected, pumps were rehabilitated and/or replaced.
- Repairs to Fenton Tank to improve operational effectiveness and maximize the serviceable life of the tank.
- On-Campus metering program to account for demand and reduce unaccounted water.
- Rebuilding of Cla-Vals to modulate flow/pressure.
- Replacement of water pipe on North Eagleville Road.

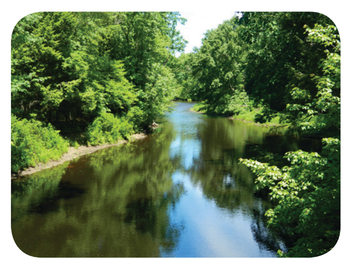
A typical University of Connecticut Well Facility

Additionally, the water system (tanks, pumps, equipment, etc.) will be included in UConn's new asset management system to assist with reliability and preventative maintenance.

A comprehensive leak detection and fire hydrant survey was done and concluded that there were no damaged hydrants or system leaks found during the inspection.

Source Protection

The University actively protects its wells, wellfields, and the Fenton and Willimantic Rivers, which are valuable water resources. Pursuant to the Connecticut Environmental Policy Act (CEPA), the University undertakes Environmental Impact Evaluations for construction projects based on their size, location, cost or other factors. This process, administered through the State Office of Policy and Management (OPM), provides state agencies, the town of Mansfield, environmental organizations, and interested citizens an opportunity to participate in the review process on a project regarding its potential environmental impact. The University also cooperates with Windham Water Works regarding watershed inspections on the Main Campus. These inspections are designed to protect the Fenton River Wellfield and the Fenton River, as well as the downstream reservoir that serves the Windham Water system.



Willimantic River

The University utilizes its aquifer mapping information to delineate the areas of groundwater recharge for its wellfields. This technical evaluation, required by DEEP, shows the critical areas of direct recharge that must be protected from certain development. DPH, in conjunction with DEEP, maintains Source Water Assessment Program (SWAP) reports on the Fenton River and Willimantic River wells. These reports evaluate potential threats of contamination to our wells. The University's wellfields have an Overall Susceptibility Rating of "LOW," the best possible rating. To ensure continued source protection, however, the University will remain vigilant in protecting all of its water supply sources in the years to come. For more information regarding the SWAP report, visit the DPH's Web site at www.ct.gov/dph.

Water Usage

Overall, the total potable water usage in 2018 decreased compared to 2017 likely due to a slight decrease in growth in service population. From 2005 to 2018, the average daily demand on the UConn water system has decreased from 1.49 million gallon per day (mgd) to .84 mgd. While the on-campus service population increased by nearly 17 percent over that time, the average daily water demand decreased by approximately 43 percent.

To accomplish that reduction, the University made many water system changes to the infrastructure and operations, which has helped to increase overall water use efficiency. We continue to build on the progress made in previous years by renewing our program to replace water fixtures in campus buildings with water-saving devices, and the University remains diligent about reducing wasted water through routine leak detection and repair.

Over the years, several of the older buildings on campus have been renovated with water-conserving fixtures. However, a robust program to retrofit fixtures in all buildings began in earnest in 2014 and continued throughout 2015. All residence halls faucet aerators and shower heads have been replaced with low flow fixtures, and have had a reduction of as much as 50,000 gallons per day has been seen as a result.

In addition to reclaimed water and other improvements made to the water system, the cooperation from our consumers about conserving water certainly helped contribute to our overall drop in water usage. We appreciate your efforts to conserve water when we issue our conservation requests and throughout the year.

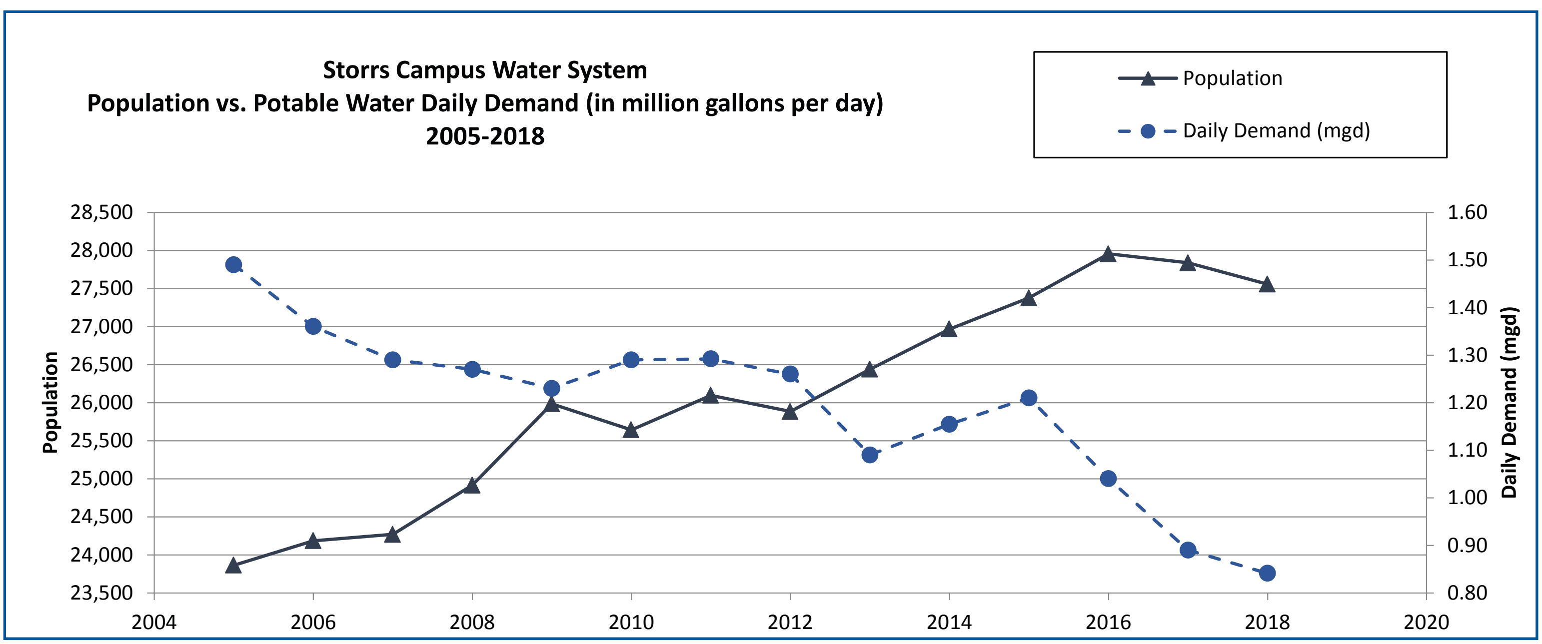
Water Conservation

While our water system does not pump water directly from the local rivers, it does extract groundwater from local aquifers that help sustain them. Extended dry weather naturally reduces streamflow which, in turn, may stress fish and other biotic stream habitat. That's why we respond with conservation measures of our own and request our customers to conserve water during these periods. UConn and NEWUS appreciate your cooperation and encourage the wise and efficient use of water at all times by applying the following tips:

- Install water-efficient fixtures and equipment, such as water-saving shower heads and toilets.
- Take shorter showers.
- Turn off faucets and showers when not in use.
- Wash full loads in washing machines/dishwashers.
- Limit running water in food preparation.
- Limit outdoor watering to early mornings or evenings, and do not water on windy days.
- Mulch around plants to reduce evaporation.
- Limit running water time when washing a car, or use a car wash.

Repair leaks:

- In UConn dorms, promptly report leaks to your Resident Advisor.
- In other campus buildings, to report leaks to Facilities Operations, use mobility through AIM or the myuconn app or call 860-486-3113.



APPENDIX N

Rules and Regulations of the University of Connecticut Water System

University of Connecticut
Board of Trustees

June 20, 2006

The following is an excerpt from the University of Connecticut Board of Trustees' minutes of June 20, 2006:

"On a motion by Mr. Kuchta, seconded by Mr. Martinez, **THE BOARD VOTED** to approve the Water System Rules and Regulations for the University and its non-University affiliated users to become effective October 1, 2006.

The full resolution is presented in the agenda of the June 20, 2006 meeting in Attachment 4.

Ronald C. Schurin
Executive Secretary

June 20, 2006
Date

An Equal Opportunity Employer

Gulley Hall
352 Mansfield Road Unit 2048
Storrs, Connecticut 06269-2048

Telephone: (860) 486-2333
Facsimile: (860) 486-2627

THE UNIVERSITY OF CONNECTICUT

WATER SYSTEM

RULES AND REGULATIONS

As Approved by Univeristy of Connecticut Board of Trustees

Effective Date: October 1, 2006

RULES AND REGULATIONS

OF

THE UNIVERSITY OF CONNECTICUT WATER SYSTEM

Dear Customer:

Providing high quality water and service to all our customers requires us to have uniform practices. The following Rules and Regulations, which cover our Water System's policies and procedures, have been approved by the University of Connecticut Board of Trustees. We urge you to read them and keep them for reference.

This booklet focuses on frequently asked questions. It is impossible to anticipate every situation that may arise, so if you have questions that require further explanation, please contact us by calling our Work Order Control Department at 860-486-3113.

These policies and procedures help us provide you with quality water and service while ensuring fair and equitable treatment for all of our customers. We appreciate your cooperation and compliance with these provisions.

Sincerely,

[redacted]

Effective Date

RULES AND REGULATIONS
OF
THE UNIVERSITY OF CONNECTICUT WATER SYSTEM

TABLE OF CONTENTS

Effective Date

ABOUT YOUR WATER SERVICE

The University of Connecticut Water System is a University owned water utility serving not only the University of Connecticut Storrs Campus and Depot Campus, but also residential, commercial, and municipal customers located in the Storrs/Mansfield area. The University of Connecticut is committed to providing all of our customers with a reliable supply of high quality water.

Please call our Work Order Control Department at 860-486-3113 Monday through Friday, 8:00 A.M. to 4:30 P.M., except holidays, if you need assistance for routine customer service matters such as:

- Account information
- A billing question
- A special payment arrangement
- A pending property sale
- To schedule a service appointment

If you ever need emergency service, you may call the same telephone number (860-486-3113), which is our Work Order Control Department anytime, 24 hours a day.

Please note the following services:

We will furnish rate schedules and such additional information as customers may reasonably request.

We maintain a regular water sampling program in compliance with state and federal requirements to monitor water quality at our sources and in the distribution system.

We periodically flush all mains and test hydrants and valves to assure the best possible quality and fire protection. Some discoloration can occur in conjunction with flushing and may cause temporary inconvenience to customers in the area.

We can assist customers whenever possible to locate or mark out existing underground pipes. If a customer is planning excavation on their property, they need to utilize Connecticut's one-call system, Call Before You Dig, Inc., at 1-800-922-4455 to ensure the identification and proper marking of underground utilities are done prior to the excavation.

We will, upon request, send a service person to turn off a curb stop if the customer's main valve is not holding, so that necessary repairs can be made. A charge is made for the turn on.

We hope these Rules & Regulations will clarify any questions you may have about your water service. If you have further questions or suggestions for improved service, call us at 860-486-3113. We will be glad to hear from you.

Effective Date

RULES AND REGULATIONS
(Subject to change without notice)

I. DEFINITIONS

Common Enclosure: Property under common ownership which is bounded by fences, property lines, public streets or highways.

Cross Connection Control Device: A Department of Public Health approved device for preventing backflow, also known as back pressure or back siphonage device.

Curb Stop: A shut off valve on water service connection generally located at the curb or property line.

Customer: Any person, firm, corporation, company, association, governmental unit, lessee who, by the terms of a written lease, is responsible for the water bill, or owner of property furnished water service by the Water System.

Delinquent Account: A water service bill which has remained unpaid for a period of more than 63 days after the date of mailing of a bill rendered on a quarterly or semi-annual basis.

DPH: State of Connecticut Department of Public Health.

Family: Individuals living as a single housekeeping unit.

Fire Service Line: A service pipe used exclusively for fire protection purposes.

Main: A water pipe owned, operated and maintained by the Water System, which is used for the purpose of transmission or distribution of water but is not a water service pipe.

Meter: A device for measuring the quantity of water used as a basis for determining charges for water service to a customer. A meter is owned by the Water System.

Meter Vault or Meter Pit: An outdoor pit or vault used to house a water meter when no suitable location is available within the premises. Meter pits and vaults, including their covers, shall be owned and maintained by the property owner, and must be constructed in accordance with Water System specifications.

Meter Yoke: Piping and valve arrangement approved by the Water System used for installing a Water System meter. The meter yoke is owned and maintained by the customer.

Premises: Shall include but is not restricted to the following:

a.) A building or combination of buildings owned or leased by one customer, in one common enclosure, occupied by one family as a residence or one corporation or firm as a place of business.

b.) Each unit of a multiple house or building separated by a solid vertical partition wall occupied by one family as a residence or one corporation or firm as a place of business.

c.) A building owned or leased by one customer and having a number of apartments, offices or lofts which are rented to tenants using in common one hall and one or more means of entrance.

d.) A building two or more stories high under one roof owned or leased by one customer and having an individual entrance for the ground floor occupants and one for the occupants of the upper floors.

e.) A combination of buildings owned by one customer, in one common enclosure, none of the individual buildings of which is adapted to separate ownership.

f.) A public building.

g.) A single plot used as a park, recreational area, or for other purposes.

Reasonable Amortization Agreement: A mutually agreed upon promise of a customer to pay an account balance over a reasonable period of time.

Receipt or Received: Three days after the date of mailing, or, if a bill notice or other document is delivered rather than mailed, the date of delivery, unless another date can be shown.

Service Connection: The service pipe, including corporation stop, from the main to and including the curb stop adjacent to the street line or the customer's property line, and such other valves and fittings as the Water System may require between the main and curb stop, which are owned and maintained by the Water System.

Tap: The fittings installed at the main to which the service pipe is connected.

Termination: The voluntary or involuntary discontinuance of water service to an individual customer.

Water System: The University of Connecticut water system that serves the Main Campus the Depot Campus and proximal areas.

II. GENERAL RULES

a.) The Rules and Regulations as herein set forth constitute a part of the contract with every customer taking water from the Water System, each of whom shall be deemed to assent and be bound thereby. These Rules and Regulations are subject to periodic change. Copies of revised Rules & Regulations shall be made available to customers.

b.) Water service and use are charged in accordance with the Water System approved rate schedules. All metered water, whether used or lost, shall be paid for by the customer.

c.) The Water System's regulations regarding water main extensions are available as a separate document.

d.) The Water System will undertake to provide an adequate supply of potable water at adequate pressure throughout its system, but cannot assume responsibility or liability, direct, indirect or consequential, for any damage from failure to do so. Whenever possible, work requiring the interruption of service will be scheduled to provide the least inconvenience to the customer. The Water System will make a reasonable effort to give notice in advance of any work requiring the interruption of service. To safeguard against possible damage due to interruption of service, customers are advised to regulate their installations connected with the water supply system so that damage will not occur if water is shut off without notice.

e.) Authorized employees or contractors of the Water System shall have reasonable access to customers' premises for the purpose of reading, testing, repairing, installing or replacing meters and meter appurtenances; inspecting plumbing connections, fixtures or pipes, or discontinuing service for any reasons listed under Section VII. Such employee will carry a badge, identification card or insignia identifying him/her as a Water System employee or a contractor employee. Services rendered after hours or on weekends or holidays are subject to special charges.

f.) The piping and plumbing on all premises supplied from the Water System shall conform to the State of Connecticut Public Health Regulations and Building Code and Sanitary Codes, if any, of the town in which the premises are located.

g.) Customers are responsible for keeping their service pipe, house pipes and fixtures in good order and protected from freezing. Failure to do so may result in interruption of service and costly repairs for which the Water System is not liable. (See Sections IV-i, j and k.)

h.) Whenever the public interest so requires, the Water System reserves the right to curtail or suspend entirely the use of water for non-essential purposes. Such limitation of use shall be without liability on the part of the Water System.

i.) In areas where pressure is low, the Water System may recommend and/or require that customers install, operate and maintain a booster pump and tank of a combined capacity approved by the Water System. In such cases, customers will enter into a written agreement with the Water System in which they hold the Water System blameless for possible damages and inconvenience resulting from the low pressure.

In areas where pressure is high, the Water System may recommend and/or require that customers install and maintain pressure-reducing valves (PRV). In such cases, the Water System shall not be responsible for any possible damages or inconvenience resulting from the high pressure or the PRV.

j.) If there is not sufficient pressure or flow in a particular region of the Water System to permit a customer to qualify for preferred risk insurance, the expense for any improvement in the system for this specific purpose shall be borne by the customer.

k.) In the event that any customer shall use water at rates of flow that cause noticeable pressure variations in the water system, the Water System may require that the customer control their flow rates or install equipment to minimize such variations to an acceptable level.

l.) No customer shall supply water to other persons or permit any connection to be made on his/her premises for supply to other premises, without approval of the Water System for "temporary service".

m.) Any changes in location of meters or services required by the customer shall, if approved by the Water System, be made at the customer's expense.

n.) The Water System, at its discretion, may install remote reading devices on existing water meters.

o.) No pipe or fixture connected with the mains of the Water System may be connected with pipes or fixtures supplied with water from any other auxiliary source. Auxiliary Source, for the purpose of this regulation means (1) a water supply which is not approved for potable use such as a pond, river, open storage tank or large swimming pool; (2) potable water which has become unpotable, such as by the addition of chemicals or from contamination while the water is being stored or held in reserve; or (3) a private well unless safe sanitary quality and the interconnection is approved by the Commissioner of Public Health.

Such cross connections are in violation of the Connecticut Department of Public Health regulations. Installation of cross connection control devices shall be approved and inspected by Water System personnel and must be in conformance with the applicable provisions of the Public Health Code. All devices shall be easily accessible for inspection and testing. If the applicant is unable to obtain and/or install the minimum cross connection control device required by the Public Health Code, the applicant will be responsible for the next highest level of protection.

p.) All new water service lines installed on the Water System shall be provided with a Reduced Pressure Principle Backflow Preventer Device (RPD) at the entrance of each new premise served, in addition to any Backflow Devices within the premises that may be required by the Cross Connection Regulations of the Public Health Code. Such RPDs shall be installed in a suitable location protected from freezing and capable of safely draining any water discharge from the RPDs. Such RPDs shall be approved by the Water System, and shall be installed and maintained, including annual device testing, at the customer's expense.

q.) Filling of tank trucks for any purpose shall only be done at Water System designated locations with approved backflow prevention under the direction of Water System personnel.

r.) Customers who plan to install air conditioning or refrigeration equipment totaling over three tons in capacity shall provide water conserving equipment as approved by the Water System, except that if such water is subsequently re-used in industrial processing or similar purposes, water conserving equipment shall not be required.

III. APPLICATIONS AND TRANSFERS

a.) Applications for the installation of new water service shall be made on forms provided by the Water System and signed by the applicant, or a duly authorized representative, for service of the premises to be supplied. Any applicable service connection fees are payable in advance. The Water System may require appropriate identification such as a Social Security number, a driver's license, or a state issued identification card.

b.) The Water System will not accept an application for service from a customer having a delinquent water account, until the account has been paid in full.

c.) Customers shall notify the Water System when premises are to be vacated so that the water may be turned off, the meters read and/or removed, and the account transferred.

If the premises are to be permanently abandoned, owners shall notify the Water System in writing immediately so that the service connection can be closed. Closure will be made at the Water System's expense.

d.) Transfers may be authorized in writing or by verbal request by the Water System.

e.) When the Water System renders temporary or intermittent service to a customer, it may require that the customer bear the costs in excess of any salvage realized of installing and removing the service.

f.) Water for construction purposes shall be applied for on forms provided by the Water System. All water used must be metered, and charged in accordance with Water System approved rate schedule.

g.) Applicants desiring to connect to a main already under contract may be required to pay the Water System an amount which, in its judgment, represents their equitable share of the original costs of the main, or to assume their equitable share of an existing guarantee provision.

Applicants taking service from an extension of main under special contract may be required to pay the Water System an equitable share of the original cost of a pump station, storage tank or other facility.

Payments to the Water System as share of original costs will be refunded to the original depositors.

IV. **SERVICES** - (See Appendices A-D for typical service installation diagrams)

a.) A single service may not supply more than a single premise. Division of premises presently served by a single pipe will require installation of corresponding additional service pipes.

b.) All services, new or renewed, for year round use shall typically be laid at a minimum invert depth of five feet below ground surface.

c.) All services, except those for private fire protection, shall be metered. The Water System may meter private fire lines if it so desires.

d.) All new and renewed service connections with meters up to 1" in diameter are required to have installed, at the customer's expense, a meter yoke which meets Water System standards.

e.) All new and renewed services shall be sized and constructed to comply with the Water System's current design criteria and shall be a minimum of 1" in diameter. Service pipes normally shall be Type K Copper with no soldered joints underground, or cement-lined cast iron. In some instances, the Water System may approve the use of plastic pipe. Such pipe shall be PE 3408 SDR 9 polyethylene, rated from 200 psi working pressure, or PE 3406 SDR 9 polyethylene, rated from 160 psi working pressure, with this information and the NSF seal appearing on the pipe. A metallic wire or strip for ease in locating must parallel non-metallic pipe.

Service piping of any material except Type K Copper shall conform to Water System specifications. Its use must have advance approval of the Water System, and be acceptable under the requirements of the town building codes. The Water System will not allow any plastic service within 500 feet of any commercial or industrial zoned area or any area with underground fuel tanks.

f.) All services shall be provided with a curb valve and curb box at the curb or at a convenient point prescribed by the Water System between the curb and property line.

Seasonal service lines with a vertical rise shall be equipped with a stop and waste valve with an operating rod and valve box outside the building between the Water System's curb valve and the building, regardless of meter location.

Where more than one building on the premises is supplied by a single service, the branch line to each building shall have an underground shutoff valve box and operating rod outside the building.

g.) When an applicant applies for service, except in conjunction with new main extensions, the Water System will furnish, install, own and maintain such new service connections. The Water System will bear the cost of the service pipe from the main to the curb stop, the curb stop and their installation, but will make a charge to the applicant for tapping the main, furnishing and installing the corporation cock and curb box. The applicant will bear the costs of excavation, backfill removal and replacement of paving, walks, curbs, etc., necessarily incurred with respect to new services, and will be responsible for obtaining necessary permits and complying with safety requirements including shoring and all other trenching safety requirements. Services installed in conjunction with new main extensions shall be paid in full by the customer, during the life of the main extension contract.

h.) The Water System will furnish and install at its expense all replacements of service connections, except as indicated below. When replacement is made at a customer's request for change in location or size of the service, the customer shall bear the full expense of relocation or enlargement. Unless the water piping is owned by the Water System with suitable easement rights by previous negotiation, maintenance of water piping installed within a private development and supplied from one service connection to the Water System's main, shall be the responsibility of the private development. Repairs may be made and billed for by the Water System by pre-arrangement with the owners.

i.) The customers, at their own expense, shall furnish, install, own and maintain the service pipe from the curb stop to the interior of the building and shall assume ownership of a Water System approved curb box, keeping service pipe and box in good repair and keeping the curb box readily accessible. If the curb box is not accessible for Water System use, the Water System has the right to make it accessible and/or operable and bill any cost to the customer. Installation of this section of the service line should be performed by a licensed plumber or in accordance with those provisions defined in Section 20-340 of the Connecticut General Statutes. Violations of this section of the Connecticut General Statutes are subject to fines by the State of Connecticut.

j.) When there is a leak in any service pipe from the curb box to the customer's premises and the owner cannot be readily found or shall refuse to make immediate repairs, the Water System shall have the right but not the duty to make the necessary repairs and charge the customer for the same. The customer is responsible for repairing all leaks and for other repairs, renovations and maintenance to all customer owned pipe, fixtures and equipment. If a leak develops in a customer service line or a customer owned service connection, the customer shall repair it without delay. If such repair work is not completed within a reasonable period specified by the Water System (by telephone, in person or in writing to the customer), the Water System may discontinue service until the leak is repaired, or repair the leak itself. In either case, the customer shall pay all costs incurred by the Water System in performing such work.

k.) The customer shall inform the Water System prior to backfill in order that the Water System may make an inspection and test to assure that the service pipe and installation complies with Water System requirements. Testing is to include pressurizing the service pipe and a visual inspection of all joints for leakage. After inspection and approval of the trench, the depth of invert of the service may not be reduced to less than 5'-0", nor may any connection be made to the service pipe between the street shutoff and the meter. If the customer does not schedule the inspection prior to backfill, the Water System may require that the pipe be re-excavated at the customer's expense to allow the Water System to perform the necessary inspection. No service pipe shall be turned on without prior approval by the Water System.

l.) The customer shall assume the responsibility and expense of maintenance of customer's portion of the service pipe, including thawing of frozen service pipes. Such services may be lowered at the customer's expense to prevent repetition of freezing.

m.) The service pipe shall extend through that point on the customer's property line or the street line easiest of access to the utility from its existing distribution system and from a point at right angles to the existing or proposed distribution line in front of the premises to be served. If a multiple premises building is positioned at right angles to the existing distribution line, a new distribution line placed in an easement shall be necessary to permit right angle services to each premises. New or reconstructed service pipes shall not cross intervening properties. The approval of the Water System shall be secured as to the proper location for the service pipe.

n.) Water service may not be laid in the same trench with other underground utility facilities. Separation distances shall comply with the Great Lakes-Upper Mississippi River Board of State Sanitary Engineers Recommended Standards for Water Works.

o.) No service pipe shall cross any portion of a seepage or septic system or be installed less than 10 feet away from any portion of a seepage or septic system.

p.) All underground lawn sprinkling systems shall be equipped with proper backflow prevention devices. Plans for such a system shall be approved by the Water System before the installation is made, and the Water System's final on-site inspection and approval is required before backfilling.

q.) If a multiple family house is being served by a single service and meter, and a part of the house changes ownership, the new owner shall have a separate service and meter installed.

r.) Restoration of an abandoned service will be considered a new service installation.

s.) The installation of combined fire and domestic services will not be permitted without special approval of the Water System. Prior to installation of fire sprinklers on any domestic service less than 2", the Water System shall be notified in accordance with Section 19a-37a-1 of the Connecticut Public Health Code. Such sprinklers may only be installed on piping that is metered. No meter bypasses are permitted for such installations. It is the customer's responsibility to have the system designed and installed in accordance with all applicable state and local regulations. The Water System makes no claim of reliability or adequacy of such system for fire protection. Such installation will not prevent the Water System from pursuing normal termination procedures.

t.) If a fire pump is desired at a customer's location, the pump curve data must be provided to the Water System for review and approval prior to installation to determine if the location is suitable for a pump.

u.) Installation of new or renewed services is not allowed in easements or right of ways, without prior Water System approval.

V. METERS

a.) The Water System shall determine the type, size and installation of the meter to be installed. All premises must be separately metered.

b.) Submetering shall be permitted only with the approval of the Water System.

c.) If a service cannot be shut down for periodic testing and removal of the meter, a second meter will be required.

d.) Meters will be owned, installed, tested and removed by the Water System. Damage due to freezing, hot water, faulty connections, or customer's negligence shall be paid for by the customer.

e.) No person, other than a Water System employee, shall break seals or disconnect meters unless specifically authorized in writing by the Water System to do so. If any person takes such action without authorization from the Water System, that person will be liable for any damages which may result therefrom, and shall be billed on the basis of water used in a similar period.

f.) The customer will provide, at their expense, an accessible and protected location for the meter, which location shall be subject to the approval of the Water System at the time of service pipe installation.

The meter may be located inside a building when, in the opinion of the Water System, an inside setting will provide adequate accessibility, protection against freezing or other damage to the meter, and when the service pipe from street line to place of use does not exceed 150 feet in length. A setting within a building shall be located just inside the cellar wall at a point which will control the entire supply, exclusive of fire lines, to the premises.

When no suitable place inside the building is available, or the service pipe exceeds 150 feet in length, the Water System may require that the meter be set near the street shutoff with suitable valve in a pit at least five feet deep, with a cover. Pit and cover shall be approved by the Water System. Meter pits or vaults, including the meter vault cover, become the property of the customer upon installation, and the customer is responsible for the maintenance and repair of the vaults as needed from time to time. Meter pits or vaults should be kept accessible and free of debris, which will help prevent the meter from freezing or being otherwise damaged.

g.) The Customer is responsible for maintaining piping on either side of the meter in good condition and valved on both sides of the meter so that the meter may be removed or replaced conveniently and without damaging such piping. If a problem should develop subsequent to meter removal or replacement due to poor condition or the piping or hand valve, the customer shall be responsible for any necessary repairs and damage.

h.) Swimming pools or other facilities, which might require considerable quantities of water, may be required to be separately metered and to have separate services. Customers are not permitted to fill pools with water directly from hydrants. The Water System may pursue appropriate enforcement action and may assess a usage fee based on estimated metered consumption.

i.) The customer is requested to notify the Water System promptly of any defect in or damage to the meter or its connections.

j.) In order to assure accuracy, the Water System may at any time remove a meter for tests, repairs or replacement. At a minimum, meters will be tested periodically in accordance with the testing schedule adopted by the Water System. Customers shall allow the Water System access to their property for such periodic meter tests.

k.) Upon written request of a customer, the Water System will test without charge to the customer, the accuracy of a meter in use at his premises provided the meter has not been tested by the Water System within one year prior to such request.

Upon a request by a customer, the Water System shall notify the customer in writing within one week of the request that he, or his authorized representative, has the right to be present during the test. If the customer wishes to be present for the meter test, he shall notify the Water System within 10 (ten) days of the written notification to arrange to be present for the test. The Water System shall schedule a convenient time for all parties at an approved meter testing facility as soon as possible. A written report of the results of the test shall be furnished to the customer. The customer shall agree to abide by the results of such test as the basis for any adjustment of disputed charges.

l.) The Water System can assume no responsibility for the clogging of interior house plumbing or flooding which may occur during or after interruption of service or repairs to services, meters or mains.

m.) The Water System may, at its discretion, install remote meter reading devices on its existing customers' meters. Customer requests for these installations will be reviewed on the basis of necessity.

n.) The Water System may not be required to install a meter until all the requirements for a new service installation have been met, including the installation of a meter yoke.

VI. BILLING AND COLLECTION

a.) Separate premises shall be separately billed.

b.) Bills are payable when rendered. Failure of the customer to receive the bill or notice does not relieve him/her from the obligation of payment or from the consequences of its non-payment.

c.) The property owner is generally the customer of record and is responsible for payment of water bills. However, if the property is rented or leased, the tenant may be the customer if a written lease specifies that the tenant is responsible for the water bill. The Water System's usual procedures for applying for water service should be followed in either case.

d.) The Customer shall be liable for all charges for water service until such service has been disconnected by the Water System pursuant to instruction from the customer or until the Water System receives a notice of change in ownership or change in lessee.

e.) Where a premise is supplied by two or more meters connected to a single service, the minimum charge for each meter shall be applied and the registrations combined in the computation of consumption charges. Where a premise is supplied through more than one service, the minimum charge shall be applied to each meter and the registrations shall not be combined. Combined billing will not be allowed except where approved by the Water System.

f.) Customer billing is normally quarterly or semi-annually with the frequency for an account determined by the Water System based on the days of service, classification and consumption.

g.) Private fire protection charges are billed either quarterly or semi-annually and cover service during the previous quarter or six month period.

h.) Water for construction purposes, or for tank trucks, will be metered in accordance with the Water System's approved rates and charges.

i.) Miscellaneous sales are billed as the service is rendered.

j.) Bills that are incorrect due to meter or billing errors will be adjusted as described below:

Whenever a meter in service is tested and found to have over-registered more than two percent, the Water System will adjust the customer's bill for the excess amount paid determined as follows:

1.) If the time at which the error first developed can be definitely determined, the amount of overcharge shall be based thereon.

2.) If the time at which the error first developed cannot be definitely determined, it shall be assumed that the over-registration existed for a period equal to one-half of the time since the meter was last tested. If more than one customer received service through the meter during the period for which the refund is due, a refund will be paid to the present customer only for the time during which they received service through the meter.

Whenever a meter in service is found not to register or meter reading is not available, the Water System may render an estimated bill. The Water System will estimate the charge for the water used by averaging the amount registered over a similar period preceding or subsequent to the period of non-registration or for corresponding periods in previous years, adjusting for any changes in the customer's usage.

Billing adjustments due to fast meters will be calculated on the basis that the meter should be 100% accurate. For the purpose of billing adjustment, the meter error shall be one-half of the algebraic sum of the error at a maximum test flow plus the error at intermediate test flow.

When a customer has been overcharged as a result of incorrect reading of the meter, incorrect calculation of the bill, incorrect connection of the meter, or other similar reasons, the amount of the overcharge will be refunded or credited to the customer.

When a customer has been undercharged as a result of incorrect reading of the meter, incorrect calculation of the bill, incorrect connection of the meter, or other similar reasons, the Water System may bill or otherwise hold the customer financially liable for no more than one year after the customer received such service.

k.) The Water System must receive approval from the local fire marshal before a customer's request for discontinuance of a private fire service can be processed by the Water System. The owner is responsible for billings until terminated.

VII. DENIAL OR TERMINATION OF SERVICE

a.) Refusal or discontinuation of service by the Water System is restricted to certain situations, as described in this Section of the Water System's "Rules and Regulations".

b.) Notices regarding termination of service shall:

1.) Be sent via first class mail at least 15 days before the termination.
2.) Contain the grounds for termination.
3.) Contain explanation of customers' rights.

c.) New service may be denied or termination proceedings may be started by the Water System for any of the following specific reasons.

1.) Service may be terminated <u>without</u> notice, for:

a.) A condition determined by the Water System to be hazardous.
b.) In the event of illegal or unauthorized provision of service.

2.) Service may be terminated <u>with</u> notice, for:

a.) Failure by a customer to comply with the terms of any agreement whereunder they are permitted to amortize the unpaid balance of an account over a reasonable period of time, or any failure for such a customer to simultaneously keep their account for utility service current as charges accrue in each subsequent billing period. Except where the customer has made a payment or payments amounting to 20% of the balance due, in which case the Water System shall not terminate service until further notice of the conditions the customer must meet to avoid termination is sent to the customer. Such notice shall not entitle the customer to further review as provided by Subsection VII e-1 of these regulations or to additional notice upon subsequent payment of 20% of the balance due.

b.) Failure of the customer to furnish such service, equipment, permits, certificates or rights of way as shall have been specified by the Water System as a condition to obtaining service, or if such equipment or permissions are withdrawn or terminated.

c.) Failure of non-residential customer to fulfill their contractual obligations for service or facilities.

d.) Failure of the customer to permit the Water System reasonable access to its equipment during normal working hours.

e.) Failure or refusal of the customer to reimburse the Water System for repairs to or loss of Water System property on the customer's property when such repairs are necessitated or loss is occasioned by the intentional or negligent acts of the customer or their agents.

f.) Customer use of equipment in such a manner as to adversely affect the Water System's equipment or the Water System's service to others.

g.) When the Water System has discovered that a customer has obtained unauthorized water service by fraudulent means or material misrepresentation or has diverted the water service for unauthorized use or has obtained water service without same being properly registered upon the Water System's meter.

h.) Tampering with the equipment furnished and owned by the Water System.

i.) Violation of or non-compliance with the Water System's Rules and Regulations.

j.) When the Water System has determined that the furnishing of water service would be contrary to any orders, ordinances of laws of the federal or state government or any political subdivision thereof.

k.) Failure of the customer to make necessary service line repairs after reasonable notice to avoid the wasting of water.

l.) Failure of the customer to provide identification within 15 days of opening an account.

m.) Non-payment of a delinquent account, provided the Water System notified the customer and is in accordance with all of the procedures prescribed in these Rules And Regulations.

n.) In the event unauthorized unmetered service or unauthorized metered service is found to be used.

o.) Failure to comply with the Public Health Code of the State of Connecticut pertaining to cross connection control requirements at the premises.

d.) Termination proceedings may be started by the Water System for non-payment of a delinquent account, provided that the Water System has notified the customer of the delinquency and has made a diligent effort to have the customer pay the delinquent account. A termination notice to a customer whose account is delinquent will be mailed no earlier than 63 days after mailing the original quarterly or semi-annual bill. Actual termination of the service will not occur earlier than 13 days after mailing the termination notice.

e.) The Water System will not terminate service to a customer if:

1.) the customer has filed an unresolved complaint or dispute with the Water System. Such complaints must be made to the Water System within seven days of receipt of a termination notice. Such complaint shall be reviewed by the Water System in accordance with the provisions of Section 16-3-100 (g) of the Regulations of Connecticut State Agencies;

2.) there is known to be serious illness in the home of a residential customer. The Water System must be notified by a doctor within 13 days of a customer's receipt of a termination notice, and such notice must be confirmed by letter within a week after the verbal notification. The notice must be renewed every 15 days or the last day of the period specified by the physician as to the length of the illness. The customer is required to make a reasonable arrangement with the Water System to pay the delinquent part of his/her bill, and to pay all future bills on a current basis while the illness continues;

3.) the customer is a landlord or agent for an occupied residential rental property, and the delinquent bill is for water service to that property. If practicable, arrangements may be made with the tenant for payment of bills for future service, and appropriate legal action may be taken against the customer for the delinquent and current amounts. However, if reasonable arrangements have been made with the tenant and the tenant refused to cooperate, the Water System may terminate service to the tenant upon proper notice;

4.) the day immediately prior to a weekend or holiday except under conditions as set forth in sub-paragraph 1 (a) of this section.

VIII. PRIVATE FIRE SERVICE

a.) Fire hydrants and sprinkler systems shall be installed and maintained at the expense of the customer. The size, material and locations of piping, and plans and specifications for any tanks and pumps that may be required, shall be submitted in writing to the Water System for approval. The Water System must inspect the installation before backfill and must witness the pressure test and all flow tests for compliance with the approved plans and specifications. The Water System may meter private fire lines where there is demonstrated justification such as unauthorized use of the service and/or where unusual circumstances prevail in the customer's premises.

b.) Operating tests of private fire hydrants and sprinkler systems shall be made only after 96 hours written notification to, and approval by, the Water System.

c.) No water shall be taken from a private fire hydrant except for use on the property in which it is located, nor for any purpose other than to extinguish fires or to test fire fighting equipment. Such uses of water for purposes other than fire fighting shall be made only after 96 hours written notification to and approval by the Water System.

d.) The Water System shall not be held liable or responsible for any losses or damage resulting from fire or water which may occur due to the installation of a private fire service system or any leakage or flow of water therefrom.

e.) In cases where a private development is to be served by a single service connection and ownership of the single service pipe or distribution main is not held by the Water System, a separate fire service main may be required to accommodate private fire hydrant service.

f.) With Water System approval, a single fire service may service more than a single premise.

g.) A backflow prevention device shall be required on a line to a fire sprinkler system with any siamese connection in accordance with the Connecticut Public Health Code.

h.) The Water System must receive approval from the local fire marshal before a customer's request for discontinuance of a private fire service can be processed by the Water System. The owner is responsible for billings until terminated.

i.) Prior to the installation of any fire sprinkler system, the Company shall be notified in accordance with Section 19a-37a-1 of the Connecticut Public Health Code.

IX. PUBLIC FIRE PROTECTION

a.) Fire departments desiring to use water from hydrants for testing equipment or for any purpose other than that of extinguishing fires, must notify the Water System in writing 96 hours in advance of such usage.

b.) Persons who desire to use water from public hydrants for purposes other than fire fighting must first obtain permission in writing from the Water System. Persons using water without permission of the Water System shall be prosecuted to the full extent of the law.

c.) All public fire hydrants shall be owned and maintained by the Water System.

X. WATER SYSTEM RESPONSIBILITIES

a.) The Water System undertakes to supply its customers with water which meets the requirements of the State of Connecticut Department of Public Health, and which has such physical and chemical properties as to make it acceptable for domestic use. However, the Water System does not undertake to render any special service, to maintain any fixed pressure, to deliver any fixed quantity of water, or special quality water.

b.) The Water System shall not be liable for any damage to person or property, sustained as a result of any break, failure or accident in or to its system or any part thereof, which is not due to the Water System's negligence, or which, being known to the customer, was not reported by that customer in time to avoid or mitigate such damage.

XI. NOTES

Effective Date

XII. APPENDIX

a.) Diagram - Typical Water Service Installation

b.) Diagram - Typical Water Service Installation with a Meter Pit

c.) Diagram - Typical Meter Yoke Installation and with PRV

APPENDIX O

Summary of Potential New Sources of Supply

6.0 ALTERNATIVE #2 –REPLACEMENT OF WELL A AT THE FENTON RIVER WELLFIELD

6.1 ASSESSMENT OF FEASIBILITY

This alternative contemplates replacement of Well A at the existing Fenton River wellfield for the purpose of increasing the yield from this supply to meet (in whole or in part) the identified water supply needs. This alternative would relocate the point of withdrawal for Well A to a replacement well (Well E) located a greater distance from the Fenton River. The intent of this replacement would be to utilize the new well during low streamflow conditions in the Fenton River. The University's available water may therefore increase during low-flow months as a result of this alternative, thus increasing system margin of safety during these periods. As stated in the 2011 University *Water Supply Plan*, the ability to provide some supply during the summer months when the Fenton River Wellfield would normally be shut down would restore margin of safety (MOS) in the short term but would not provide the increment of water believed necessary to supply the University's future committed demands or to supply to Mansfield Four Corners. As such, this alternative is being evaluated as a potentially supplemental component to be potentially implemented in conjunction with one or more of the remaining alternatives.

University graduate students have been conducting modeling of the aquifer at the Fenton River Wellfield under the guidance of Dr. Glenn Warner, P.E. of the Department of Natural Resources and Dr. Amvrossios C. Bagtzoglou of the Department of Civil and Environmental Engineering. The model utilized in the 2006 *Fenton River Study* has been updated with additional geophysical data. Specifically, additional geophysical studies have been performed near the Fenton River Wellfield utilizing ground-penetrating radar. The information gleaned from the ground-penetrating radar studies has led to a greater refinement of the bedrock surface in the model for the vicinity of the wellfield.

The geophysical work has indicated that a preferred area for a replacement well (to be designated as Well E) approximately 350 feet southwest from existing Well A, is roughly 13 meters (46 feet) deep to bedrock. While this depth is less than the stratigraphy at Well B, Well C, and Well D (70 feet, 63 feet, and 59 feet, respectively as reported in the 2011 University *Water Supply Plan*), it is still deeper than the well depth of Well A (28 feet). A new well located in this area would likely have a similar yield to the remaining wells at the wellfield (300 gpm or more).

In general, geophysical data show that some areas of the bedrock surface in the vicinity of the Fenton River Wellfield are deeper than originally thought, providing additional saturated thickness that could be beneficial to a new well location. The new geophysical information collected at the wellfield was incorporated into the model in late 2011 and early 2012, with modeling scenarios being programmed and simulated during spring 2012. The model was run under various scenarios to determine the potential impact on streamflows (and therefore fisheries habitat) in the Fenton River.

The updated model has been utilized to evaluate the relocation of Well A to several locations. The preliminary findings indicate the following:

1. A comparison of Scenario 10 and Scenario 1 as presented in the 2006 *Fenton River Study* using the updated model produces similar changes in streamflow to those same scenarios presented in the 2006 *Fenton River Study*. Scenario 1 presented a pumping condition based on existing well locations, while Scenario 10 presented a pumping scenario where Well A was relocated 250 feet southwest of its present location. The distance of 250 feet was initially evaluated because it would have allowed relocation without the need for a water diversion permit.

2. Relocation of Well A to points farther from the Fenton River appears to have limited benefit to instream flows. Less than a 0.1 cfs reduction in streamflow loss was observed as compared to Scenario 1 under the same operating scenario.

3. Preliminary results suggest that a management scheme that includes shutting down the Fenton River Wellfield from June 1 through August 15 of each year, and then alternating pumping of Well A and Well D from August 15 through November 1 of each year, would have more benefit to instream flows than relocating Well A.

Although the findings of the additional modeling are helpful for informing a discussion of potential future wellfield management scenarios, the University has already identified an option in its water supply plan that allows use of the Fenton River Wellfield throughout the summer as long as the existing operational protocols are followed, with the ability to operate Well D in September. Therefore, a benefit to margin of safety is not realized by shutting down the Fenton River Wellfield from June 1 through August 15 of each year, and then alternating pumping of Well A and Well D from August 15 through November 1.

Preliminary modeling results indicate that the alternating use of Well A and Well D following a significant rest period for the entire wellfield (June 1 through August 15 at a minimum) would result in a reduction of instream flow impacts of 0.4 cfs when compared to the continuous pumping of all wells under Scenario 1 from the 2006 *Fenton River Study*. As the wells were pumped at their registered rates for this modeling, additional benefits could be realized utilizing reduced rates. Future modeling and field efforts will focus on the following:

- Alternating pumping of Well A and Well D at lower rates following a summer shutdown period as noted above;
- Pumping Well B and perhaps Well C directly into the river to buttress instream flow while some combination of Well A and Well D are pumping; and
- A pumping test during a low-flow period to confirm the modeling results for the most promising management scenario.

Should these efforts confirm that the preliminary modeling prediction that alternating use of Well A and Well D following a significant rest period for the entire wellfield will have a sustainable reduction in instream flow impacts, then steps could be taken to revise the recommendations of the *Fenton River Study* utilized for the operation of the Fenton River Wellfield in the *Wellfield Management Plan* with the proper consensus from applicable regulatory authorities.

Replacing the function of Well A with Well E would not allow additional water to be produced at the Fenton River Wellfield. The wellfield would continue to be operated under the protocols established by the 2006 *Fenton River Study* as outlined in the 2011 *Wellfield Management Plan* that specify that the wellfield should reduce withdrawals when flow in the river drops to six cfs and cease withdrawals when the flow in the river reaches three cfs as measured at Old Turnpike Road.

In addition, relocation of the withdrawals of Well A to Well E will result in a negligible benefit to instream flows.

Because the recent modeling efforts by the University have not demonstrated a benefit to margin of safety or streamflows in the Fenton River as a result of moving Well A, this alternative fails the test of project does not meet the project need.

Despite the fact that this alternative does not meet the purpose and need, the University may have the need to replace Well A in the future for operational flexibility or other reasons. Thus, the potential impacts are evaluated herein.

6.2 LAND USE AND ZONING

The Fenton River Wellfield is owned by the University of Connecticut. It is located in what is predominantly designated as a Conservation Area on *Conservation and Development Policies Map* of Connecticut. The Fenton River corridor is designated as a Preservation Area. The existence and use of public water supply wellfields within Conservation lands is consistent with the State plan provided that water is not directed to spur development in areas not designated as appropriate for public water service.

Similarly, the 2010 WinCOG Land Use Plan denotes the area of the Fenton River Wellfield as a Priority Preservation Area, with the Fenton River corridor being a High Priority Preservation Area. The WinCOG plan notes that this area is denoted as such because, at a minimum, it consists of preliminary and final aquifer protection areas (APAs) as delineated by the CT DEEP. Thus, the use of this area for public water supply purposes is consistent with the regional plan.

The 2006 Mansfield *Plan of Conservation and Development* designates the vicinity of the Fenton River Wellfield is a "Low Density Residential Area." However, the Plan also recognizes that the vicinity of the Fenton River Wellfield is a significant interior forest tract and therefore a potential conservation area. Agriculture is not practiced at the Fenton River Wellfield.

The University completed the *East Campus Plan of Conservation and Development* in 2004. This plan notes that approximately two-thirds of the East Campus area (designated as the area bounded by Route 195, Old Turnpike Road, the Fenton River, and Gurleyville Road) is forested and managed by the College of Agriculture and Natural Resources as the 440-acre Fenton Forest Tract. The Plan designates the area in the vicinity of the Fenton River Wellfield as a Preservation Area to protect the large contiguous forest parcel near the wellfield and to protect the water quality recharging the wellfield and draining to the Willimantic Reservoir downstream. The implication is that the use of the Fenton River Wellfield is consistent with the designation of Preservation Area in the *East Campus Plan*.

The *East Campus Plan* recommends that development be avoided within the Preservation Area. Maintaining existing agricultural facilities and continuing forest management and environmental education activities are allowable. In addition, renovations and/or facility upgrades to existing

- Test borings at EP-5 did not reveal the presence of contamination above detection limits for analyses required by the Connecticut DPH for a new Community water supply source.

Based on the above information, the aquifer surrounding the EP-4 and EP-5 site has several potential sources of contamination, including former gasoline spills and pollutants potentially related to the former mill activity (and potentially the reported former salt storage shed) upstream. If the gasoline leak at the service station and the gasoline contaminated wells are related, then the proposed well sites may be located in the flow path of the contamination. However, no gasoline-related contaminants were detected at EP-5 during testing in 2011.

The scattered potential contamination sources that lie within the 200-foot radius of EP-5 (e.g. solid waste, metal and tires) could be an indication that other materials may have been dumped and buried on site. In addition, surficial site debris near the proposed well site would need to be evaluated by a Connecticut licensed environmental professional (LEP) to determine any potential threat to groundwater. Given the size of the two sites, the well location could be easily moved to another location on the parcel that would comply with DPH well site regulations. However, previous land uses at the site (motorcycle track, various agricultural practices) may place the well in an area that has more contamination that the current well site.

10.1.3 SUMMARY OF FEASIBILITY

The combined potential yield from Wells MD-1, MD-3, EP-4, and EP-5 is uncertain, as is the quality of water that would be derived from them. Development of wellfields at both Mansfield Depot and Eagleville Preserve may not produce greater than 0.5 million gallons per day. For this reason, one or more wellfields along the Willimantic River is not believed to meet the project purpose and need.

It is possible that the University and/or the Town of Mansfield could pursue development of new wells in the future for operational flexibility or for other unforeseen reasons. For this reason, an evaluation of potential impact has been evaluated herein.

10.2 LAND USE AND ZONING

The four potential wellfield locations along the Willimantic River are currently utilized either for agricultural or open space as noted below:

- Well location MD-1 is currently utilized as an agricultural field.
- Well location MD-3 is currently utilized as a Town park with a recreation field (River Park).
- Well location EP-4 is currently forested and utilized as a Town park (Eagleville Preserve) although the land is owned by the State of Connecticut.
- Well location EP-5 is currently utilized as an agricultural field with surrounding woodlands utilized as a Town park.

Potential well locations MD-1 and MD-3 are located in Conservation Areas as denoted on the State *Conservation and Development Plan Locational Guide Map*, while potential well locations EP-4 and EP-5 are located on lands designated as existing preserved open space. The WinCOG regional plan notes that the four wellfield locations fall in either high priority Preservation Areas

Summary of Feasibility

The combined potential yield from wells near Mansfield Hollow are not expected to yield sufficient volume to serve the needs of the University and the Town of Mansfield, nor will they meet the project purpose and need. However, it is possible that the University and/or the Town of Mansfield could pursue development of new wells in the future for operational flexibility or for other unforeseen reasons. For this reason, an evaluation of potential impact has been evaluated herein.

11.2 LAND USE AND ZONING

The five potential wellfield locations near Mansfield Hollow Lake are currently utilized either for agriculture or open space as follows:

- Well location MH-2 is currently utilized as an agricultural field as part of the Town of Mansfield Commonfields (a historic park).
- Well location MH-3 is currently utilized as open space associated with Southeast Elementary School.
- Well locations MH-4, MH-5, and MH-6 are currently forested federal land utilized as part of Mansfield Hollow State Park.

The five potential well locations are located in areas of Existing Preserved Open Space as denoted on the State *Conservation and Development Plan Locational Guide Map*. The WinCOG regional plan notes that the wellfield locations are located in either priority Preservation Areas or permanently protected open space. These land designations are typical for many public water system sources and are consistent with the need to protect future sources of water supply. The proposed overlay zone will restrict usage of water along any potential pipeline routes to maintain consistency with nearby State Plan designations.

Well location MH-2 is currently utilized for agriculture. The majority of the upland soils on the site are considered prime farmland according to the 1987 Environmental Review Team Report. The town has a land-use agreement with a local farmer. The use of this site for the development of new wells would potentially restrict or preclude further use of this area for agriculture. Should this well site be utilized other farmland in Mansfield may need to be protected to offset potential losses.

Regardless of the well location selected, the aquifer protection area (APA) regulations in Mansfield would be affected by the presence of the new well. A new well would need to have Level A APA mapping performed to delineate the area of contribution and recharge of the groundwater flowing to the well. Thus, additional areas of Mansfield would be designated as APA areas following adoption of this alternative, and existing Aquifer Protection Agencies in the town would administer the APA regulations in these zones.

The creation of a new wellfield or wellfields near Mansfield Hollow Lake could locally affect land use at the wellfield sites; however, significant impact of land use beyond those sites is not likely to occur, particularly in light of the low yields that are anticipated from these wells.

12.0 SELECTION OF PREFERRED ALTERNATIVE

12.1 ABILITY TO MEET PROJECT NEED

Alternatives were evaluated in Sections 5 through 11 of this document. Feasible alternatives must be able to:

1. Supply a safe and reliable supply of potable water in the amount of 1.23 million gallons per day (mgd) during average day demand (ADD) conditions.

2. Supply a safe and reliable supply of potable water in the amount of 1.93 mgd during peak day demand (PDD) conditions.

3. Have the ability to expand to accommodate additional future potential on-campus growth.

Table 12.1-1 summarizes the capability of each alternative to meet the project purpose and need.

TABLE 12.1-1
Ability of Each Alternative to Meet Project Need

Alt. #	***Alternative Name***	***Able to Deliver ADD of 1.23 mgd?***	***Able to Deliver PDD of 1.93 mgd?***	***Able to Expand to Accommodate Additional Future Growth?***
#1	No Action	No	No	No
#2	Replacement of Fenton Well A	No	No	No
#3	Interconnection with CWC	**Yes**	**Yes**	**Yes**
#4	Interconnection with MDC	**Yes**	**Yes**	**Yes**
#5	Interconnection with WWW	**Yes**	**Yes**	**Yes**
#6	Development of New Groundwater Supply along Willimantic River	No	No	No
#7	Development of New Groundwater Supply Near Mansfield Hollow Lake	No	No	No

CWC = Connecticut Water Company
MDC = Metropolitan District Commission
WWW = Windham Water Works

Alternatives 3, 4, and 5 (interconnection with Connecticut Water Company, the Metropolitan District Commission, and Windham Water Works, respectively) are able to meet the project purpose need. The manner in which this can be accomplished is as follows:

- Connecticut Water Company (CWC) would draw upon the Shenipsit Reservoir while utilizing groundwater supply wells at Powder Hollow, Hunt, Preston, and other Northern Region wells within their existing registered withdrawal rates. System improvements include return of the Preston Wellfield to active use; recovery of registered capacity from the Powder Hollow and Hunt Wellfields; and expansion of the Rockville Water Treatment Plant (WTP). Piping extension would be required from the terminus of CWC's system in Tolland through a short distance in the Town of Coventry, and into Mansfield.

- The Metropolitan District Commission (MDC) would draw upon the Barkhamsted and Nepaug Reservoirs in the Farmington River basin within their existing registered withdrawal rates. Piping extension would be required from the terminus of MDC's system in East Hartford via one of two contemplated routes. Route #4A runs through portions of Manchester, Bolton and Coventry and then into Mansfield. Route #4B runs through portions of Manchester, South Windsor, Vernon, Tolland, and Coventry before entering Mansfield.

- Windham Water Works (WWW) would draw from the Willimantic Reservoir upstream of the lower reach of the Natchaug River. In order to reliably provide the University and the Town of Mansfield with additional water supply while maintaining an adequate margin of safety (MOS), WWW would require a new or modified diversion permit and a treatment plant expansion. Additionally, WWW has indicated that removal of sediment from the Willimantic Reservoir would be required by its Water Commission if this alternative were pursued.

12.2 ENVIRONMENTAL IMPACTS

A summary of potential impacts is provided below for the feasible alternatives.

12.2.1 LAND USE

Table 12.2-1 summarizes state-designated land uses and current zoning by town for the interconnection pipeline routes. The *Conservation and Development Policies Plan* for Connecticut (the State Plan) discourages provision of public water supply in areas designated as existing preserved open space, preservation areas, conservation areas, rural lands, aquifer protection areas, and historic areas.

The intended developments for which a new source of supply is being sought are all located within the Town of Mansfield in areas where such development is consistent with State Plan designations. These developments are also consistent with local zoning regulations and the Town of Mansfield's *Plan of Conservation and Development*. Under all feasible alternatives, transmission pipeline will be laid through areas in town that pass through State Plan-designated areas that are not intended for public water supply service (Refer to Figure 4.1-1). In order to address this discrepancy, the Town of Mansfield is undergoing a comprehensive and detailed revision of its regulations and has proposed overlay zones to restrict development in areas of public water supply such that local development is consistent with the State Plan. The proposed overlay zones will restrict development along potential pipeline routes within the Town of Mansfield where intense development would be inconsistent with the State Plan, local zoning designations, and/or Mansfield's *Plan of Conservation and Development*. In this manner, unwanted or unanticipated secondary growth can be avoided.

Secondary growth in the Towns of Tolland, Coventry, and Bolton could be affected by various pipeline routes associated with the interconnection alternatives. These are discussed below.