Appendix A

Conservation Plans

Lamprey River Water Management Plan

August 2013

CONSERVATION PLAN

Epping Water Works (#20045)

Introduction

Conservation plans under the Instream Flow Program (Env-Wq 1900) require meeting the conservation measures and best management practices in the Department of Environmental Services (DES) Water Conservation Rules (Env-Wq 2101). Use of these measures and practices as a standard will provide a common level of effort by all water users.

Epping Water Works provides drinking water to the residents and businesses located in the Town of Epping, New Hampshire. The active sources for the Town's water supply are four ground water wells located within the drainage of the Lamprey Designated River.

As part of the permitting of a new water supply source, Epping Water Works prepared a proposed Water Conservation Plan (dated December 1, 2010) which was reviewed and was approved February 3, 2011 by the DES Drinking Water and Groundwater Bureau (see attachment). This Conservation Plan applies to the entire Epping Water Works service area.

Water Source and Uses

The Epping Water Works water supply has five registered water supply wells located in Epping; four that are currently in use (20045-S02; 20045-S03; 20045-S04 and 20045-S05) and one that has been abandoned (20045-S01) and is not expected to be reactivated for future use. The Hoar Pond Well 1 (20045-S02) and the Hoar Pond Well 2 (20045-S04) are active bedrock wells located north of Hoar Pond and east of Beniah Lane. The Fremont Road Well (20045-S03), an active bedrock well, and Well #1 (20045-S01), an inactive gravel packed well, are located south of Fremont Road (aka Jenness Road) near an unnamed tributary to the Piscassic River. Figure 1 depicts the locations of these withdrawals with respect to the Lamprey River (Note: 20045-S99 was the former designation for the combined S01 and S02 wells.) The fifth well, Hoar Pond Well No. 3 (20045-S05), was developed in bedrock in the vicinity of Hoar Pond. Well use was reported beginning March 2012. 20045-S05 is not yet included in the GIS coverages, but would be located on the map near 20045-S04 and 20045-S02.

The three active Hoar Pond wells are located in the watershed of a Lamprey tributary upstream of the Designated River; therefore the drainage area of the impact point of those wells on the Designated River is equal to the drainage area at the head of the Designated River, which is 152.5 sq. mi. The one active Fremont Road Well is located in the drainage of the Piscassic River; therefore the drainage area of the impact point of that well is equal to the drainage area at the confluence of the Piscassic River and the Designated River, which is 211.4 sq. mi.

The analysis of induced recharge for these three bedrock wells (DES 2009a) indicates that the Fremont Road well may induce recharge from surface water at average and maximum pumping rates. The analysis of the two older wells located near Hoar Pond, Hoar Pond Wells 1 and 2, did

not indicate induced recharge from the Pond, although the pumping of these wells may intercept groundwater that would otherwise recharge Hoar Pond. The same conditions are expected to apply to the newer bedrock well – Hoar Pond Well 3. Note that the methods used to evaluate induced recharge apply to sand and gravel wells and are not ideal for evaluating wells in bedrock.

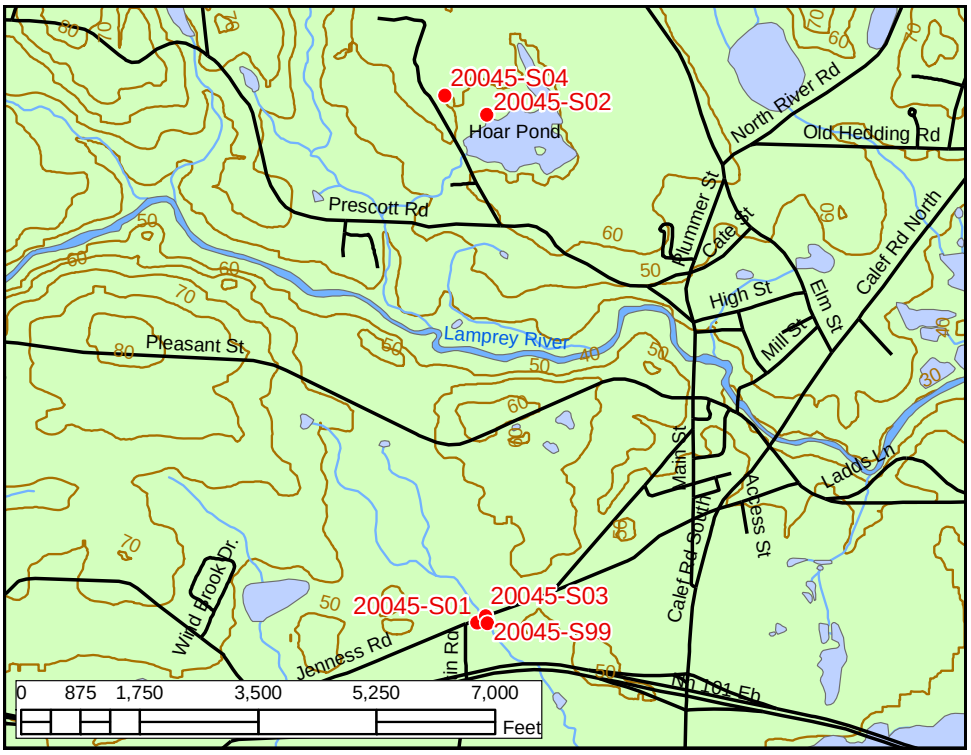

Figure 1 - Location map of Epping Water Works water supply wells.

Water Use Patterns

The groundwater withdrawn from the four active wells is the water supply for the residents and businesses in the Town of Epping. The well pumping rates of the wells are variable. The Hoar Pond wells are permitted for 185 gallons per minute (gpm). The pumping capacity of the Freemont Well is about 40 gpm. The pumping schedules and rates are set by the operators and the wells activate when they are needed to maintain the water levels in the two storage tanks that have a combined capacity of 500,000 gallons. The wells are metered and monthly water use is reported quarterly to DES.

Water use data for 1992 through 2012 are summarized in the tables and figures below. The Epping Water Works monthly water withdrawal data for the years of 1989 through 2013 were obtained from DES Water Use Reporting database. The water use records for 1989 through 1991, and for 2013, were incomplete so they were not included in the annual use summaries. Annual water use was converted from thousands of gallons to cubic feet per second (cfs) and cubic feet per square mile of drainage area (cfsm) to make comparisons with stream flow values in the Lamprey Designated River.

The system's highest annual use during the period 1992-2012 was 51.94 million gallons (1999); the lowest annual use was 32.45 million gallons (1992) (Figure 2 and Table 1). The average annual use was 41.06 million gallons. Between 1992 and 2012 annual water use increased by 18.73 million gallons or 37 percent. This represents an average increase of 0.937 million gallons per year for the 21 year period of record. Annual system water use increased from 1991 to 1999, then decreased and stabilized in the early 2000s, and has been on an increasing trend through 2012.

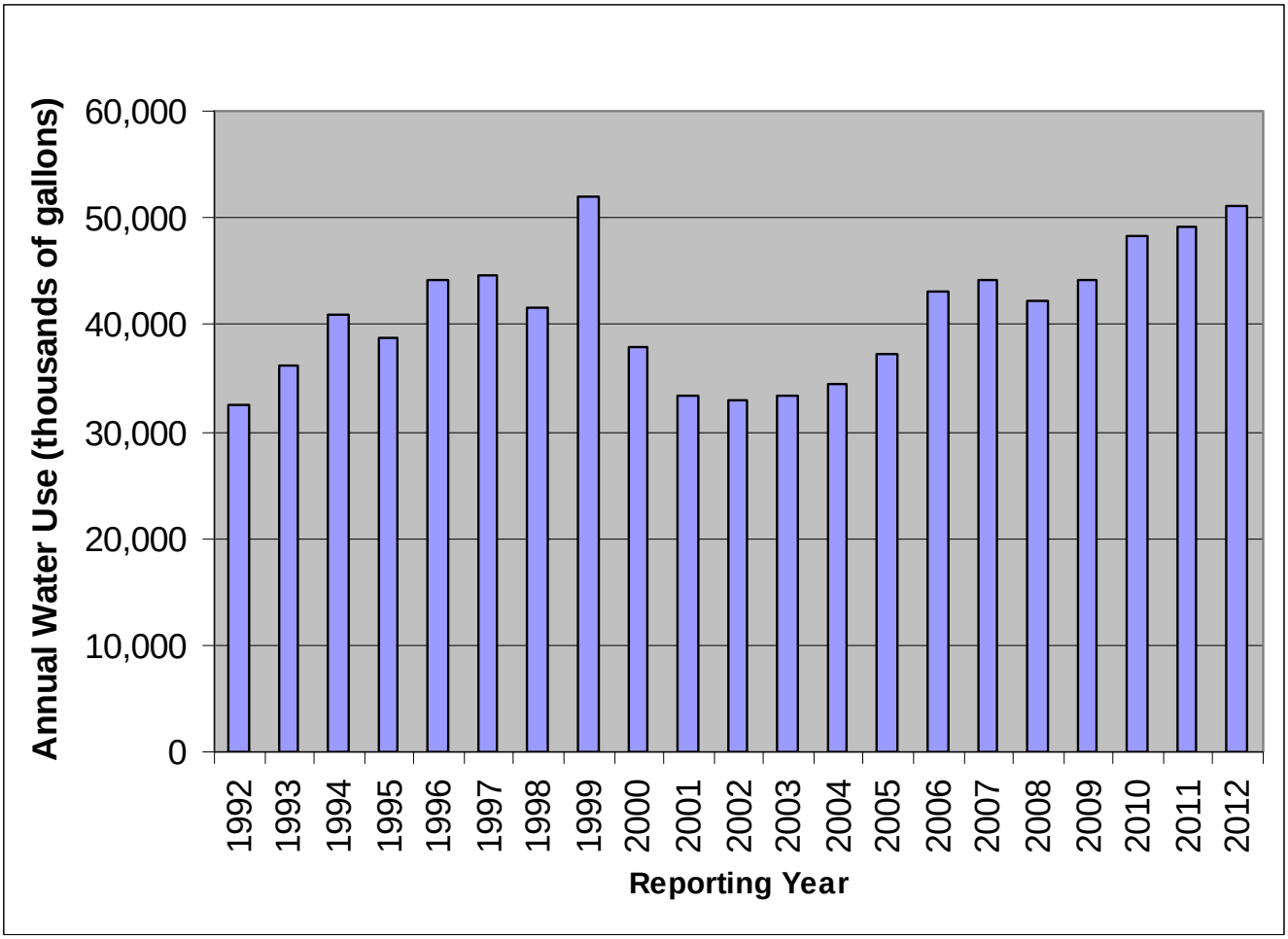

Figure 2 - Epping Water Works Annual Water Use

Table 1 - Epping Water Works Annual Water Use Statistics (1992 through 2012)

	Low	High	Average
Thousands of Gallons	32,452	51,937	41,060
cfs	0.1376	0.2202	0.1741
cfsm at Packers Falls Gage	0.00075	0.00120	0.00095

Of the annual water use at each of Epping's water sources, the greatest annual withdrawals were once from the Fremont Road Well, but since 1999 withdrawals from that well have decreased significantly and withdrawals have increased at the Hoar Pond wells (Figures 3 through 5). The transition to the Hoar Pond wells was due to decreased yield at the Fremont Road Well and better water quality in the Hoar Pond wells. During the transition, water withdrawals from Well #1 (20045-S01) were used beginning in June and July of 1997, followed by near continuous use during 1998 and 1999. Withdrawals from Well #1 stopped after July 2000.

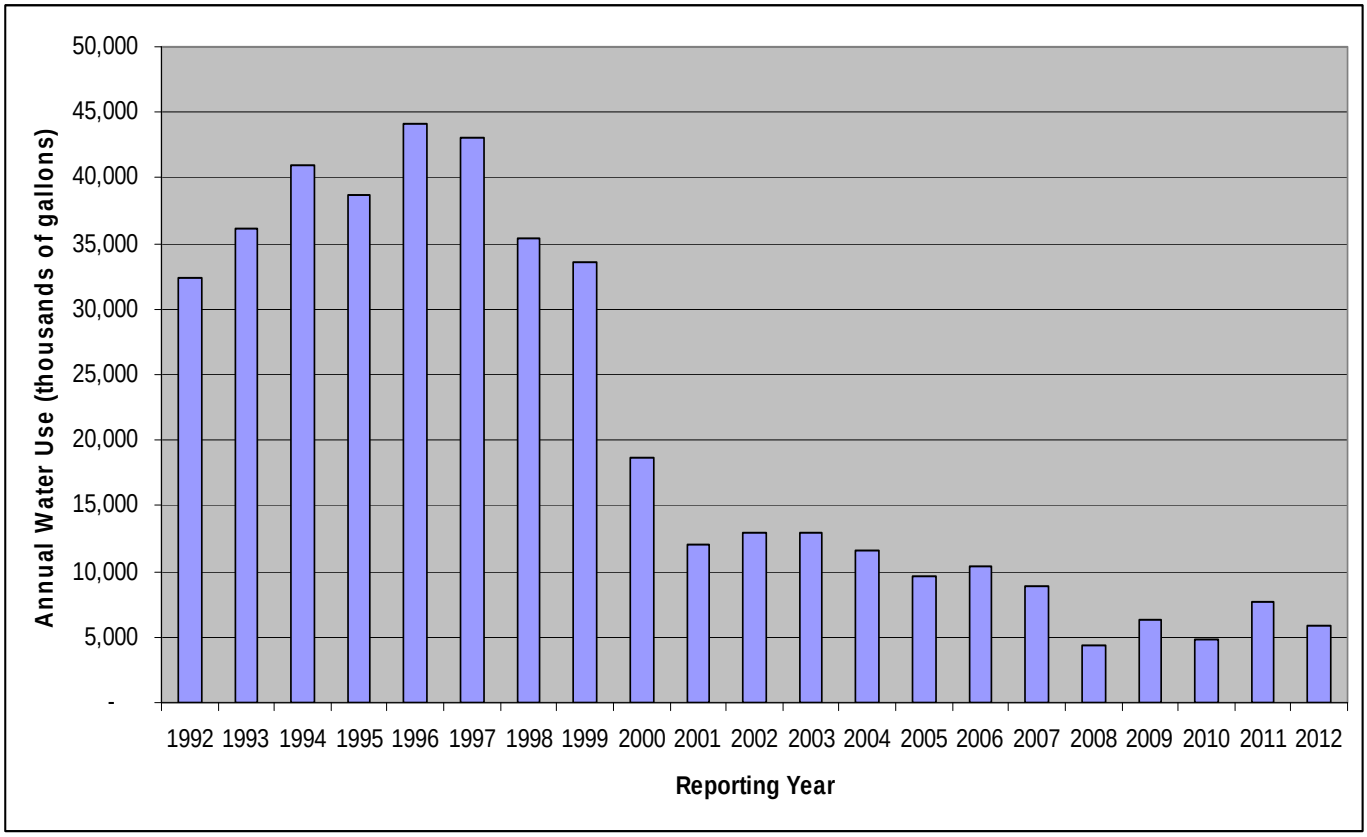

Figure 3 - EPPING WATER WORKS - FREMONT ROAD WELL (20045-S03) Annual Water Use

Table 2 - Epping Water Works - Fremont Road Well - Annual Water Use Statistics (1992 through 2012)

	Low	High	Average
Thousands of Gallons	4,394	44,135	20,501
cfs	0.0186	0.1871	0.0869
cfsm at Packers Falls Gage	0.00010	0.00102	0.00047

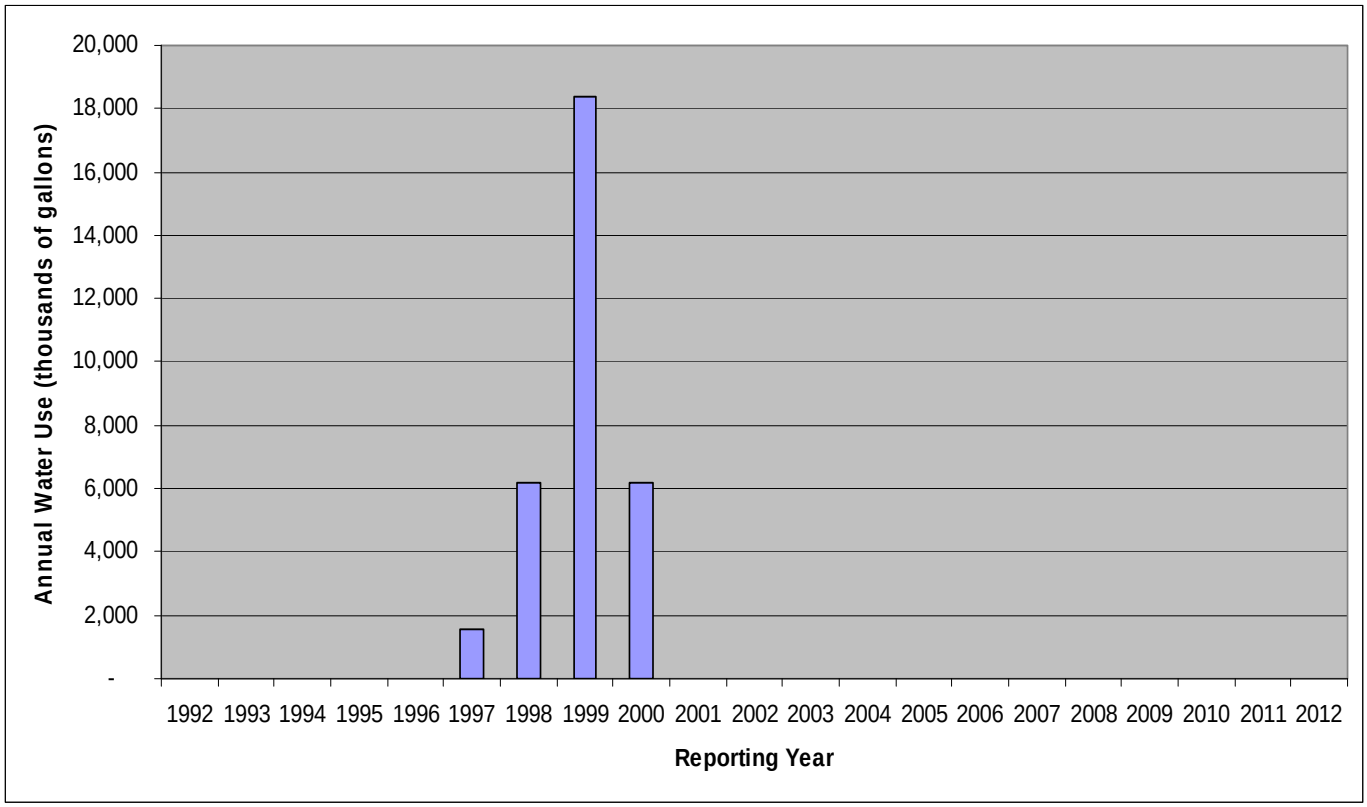

Figure 4 - EPPING WATER WORKS - WELL #1 (20045-S01) - Annual Water Use

Table 3 - Epping Water Works - Well #1 - Annual Water Use (1998-1999)

	Low	High	Average
Thousands of Gallons	6,175	18,359	12,267
cfs	0.0262	0.0778	0.0520
cfsm at Packers Falls Gage	0.00014	0.00043	0.00028

Hoar Pond Well 1 began reported water use in May 2000. Water use has been on a declining trend since that time (Figure 5 and Table 4). Hoar Pond Well 2 began reporting water use in June 2004. Water use increased annually from Hoar Pond Well 2 until 2011. Hoar Pond Well 3 (20045-S05) has been in use since March 2012 (Figure 6 and Table 5). There are insufficient data to describe annual water use at Hoar Pond Well 3. For the one year period from March 2012 through February 2013, total water use from this source was 18.170 million gallons.

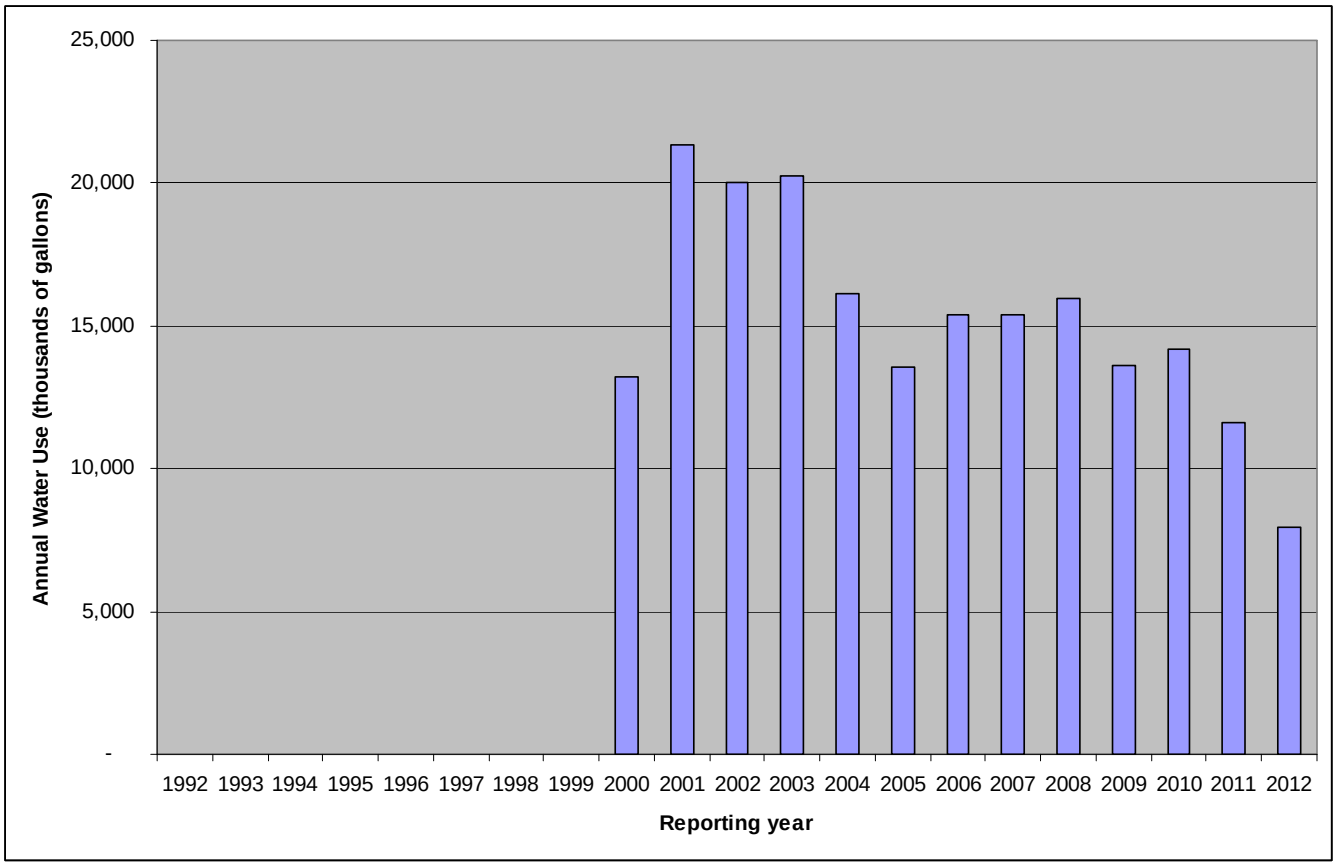

Figure 5 - EPPING WATER WORKS - HOAR POND WELL 1 - Annual Water Use (2000 includes only May through December use)

Table 4 - Epping Water Works - Hoar Pond Well 1 - Annual Water Use Statistics (2001 - 2012)

	Low	High	Average
Thousands of Gallons	7,965	21,342	15,461
cfs	0.0338	0.0905	0.0655
cfsm at Packers Falls Gage	0.00018	0.00049	0.00036

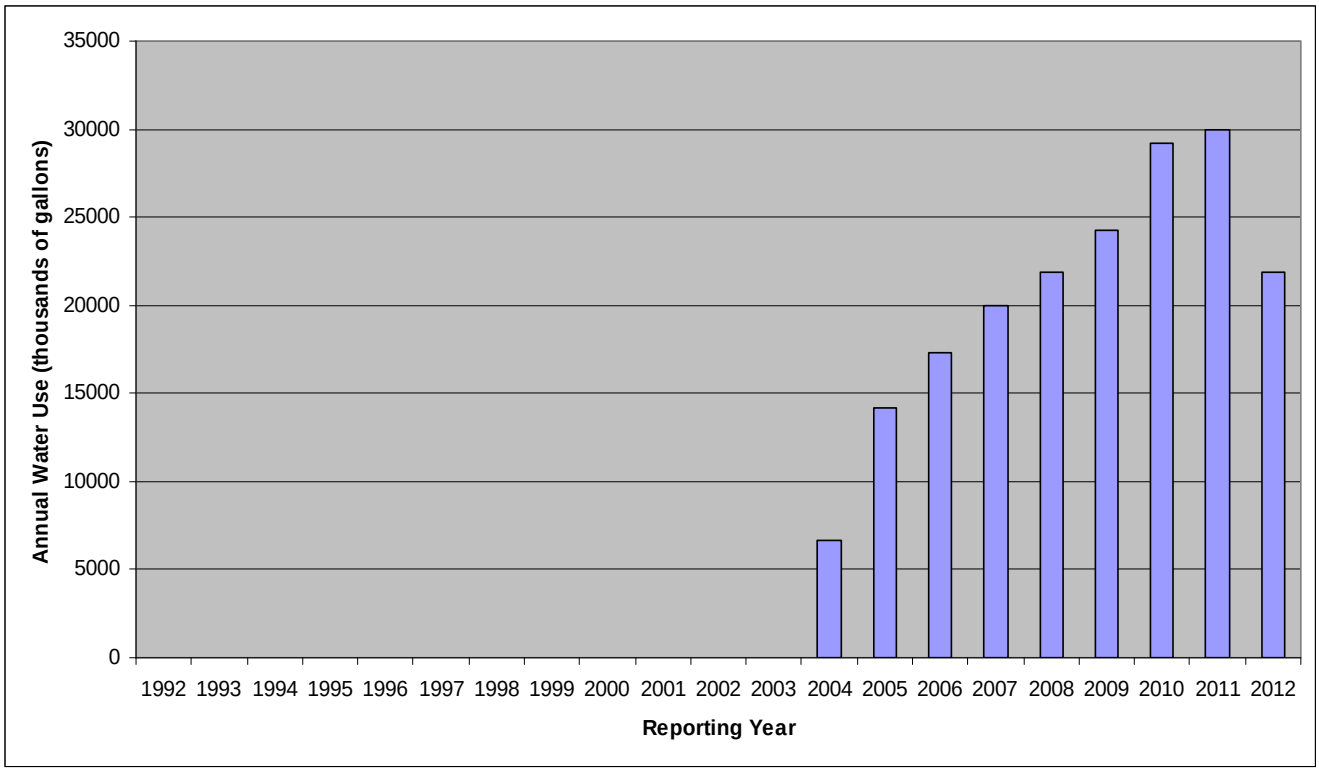

Figure 6 - EPPING WATER WORKS - HOAR POND WELL 2 (20045-S04) - Annual Water Use (2004 includes only June through December)

Table 5 - Epping Water Works - Hoar Pond Well 2 - Annual Water Use Statistics (2005 through 2012)

	Low	High	Average
Thousands of Gallons	14,177	29,958	22,334
cfs	0.0601	0.1270	0.0947
cfsm at Packers Falls Gage	0.00033	0.00069	0.00052

The monthly water use records for the Epping Water Works system begin in January 1989. Complete annual records are available from 1992. Monthly statistics were calculated for data from only complete years of record during periods of active use unless otherwise noted. The monthly water use data were converted to cubic feet per second by dividing the monthly values by days and multiplying them by a flow unit conversion factor. Based on these converted values, daily water use by the Epping Water Works has ranged from a minimum of 0.125 cfs (80,621 gallons per day, November 1989) to a maximum of 0.250 cfs (161,526 gallons per day), with an average use of 0.174 cfs (112,493 gallons per day) for the period of 1992 to 2012 (Figure 7 and Table 6).

Monthly water use varies in response to weather conditions and changes in seasonal demand. For the Epping system, the average monthly water usage was highest during summer and lowest during winter. This seasonal pattern reflects the general pattern of increased outdoor water usage (lawn irrigation, garden watering, vehicle washing, etc.) during the summer months, which declines during the fall, remains low during the winter, and begins to increase again in the spring. The highest monthly water use was 5.07 million gallons in July 2011, and the lowest total monthly use was 2.34 million gallons in February 1992. The average monthly use from 1992 through 2012 was 3.42 million gallons.

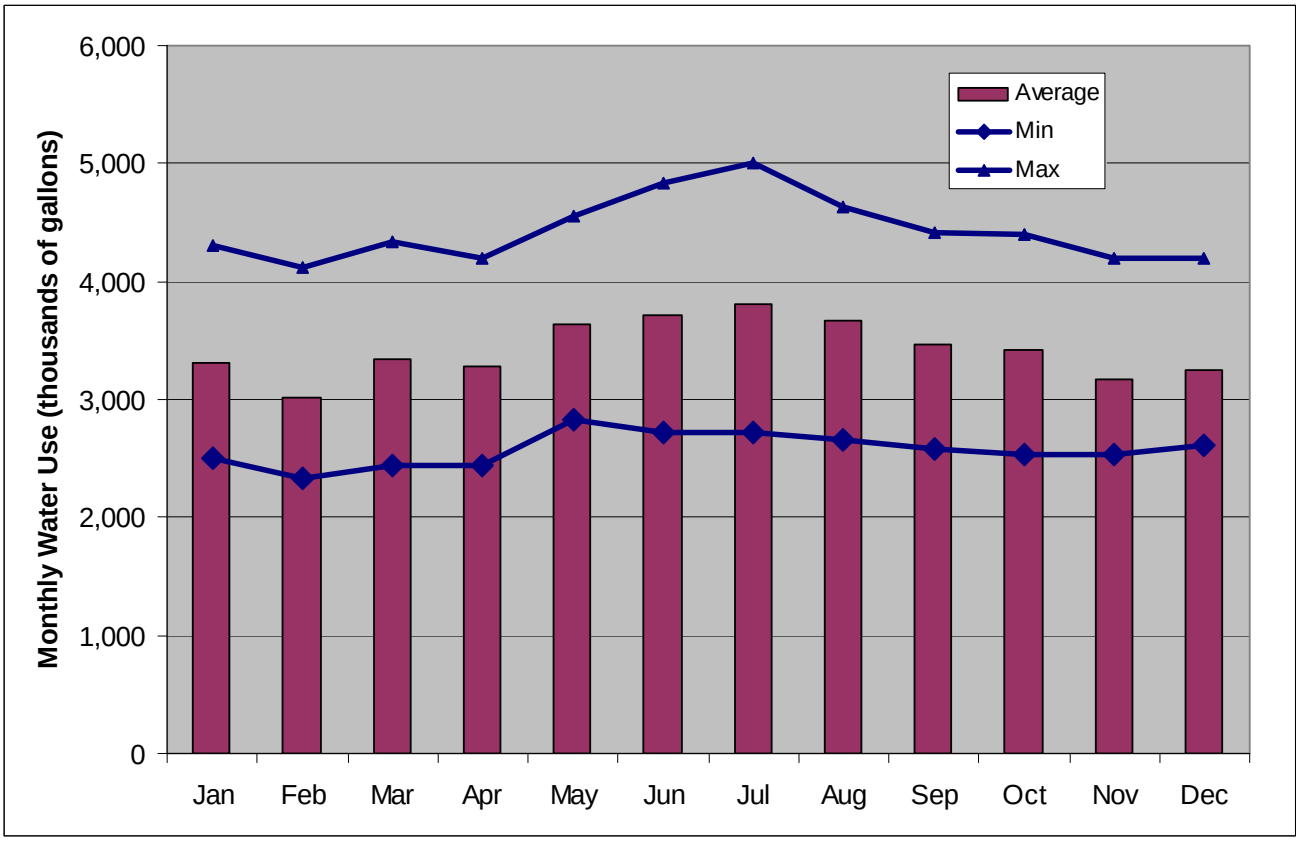

Figure 7 - EPPING WATER WORKS (20045) - Monthly Water Use (1992-2012)

Table 6 - Epping Water Works - Monthly Water Use Statistics (1992-2012)

	Low	High	Average
Thousands of Gallons	2,338	5,007	3,422
cfs	0.1189	0.2547	0.1741
cfsm at Packers Falls Gage	0.00065	0.00139	0.00095

Figures 8 through 10 and tables 7 through 9, below, show water use statistics (average, minimum and maximum) for the monthly water use from Epping Water Works individual sources. Well #1 is not presented because its record is short and inclusion would show little of interest. Hoar Pond Well 3, which began pumping March 2012, is shown despite its short record as an indication of possible rates of future water use.

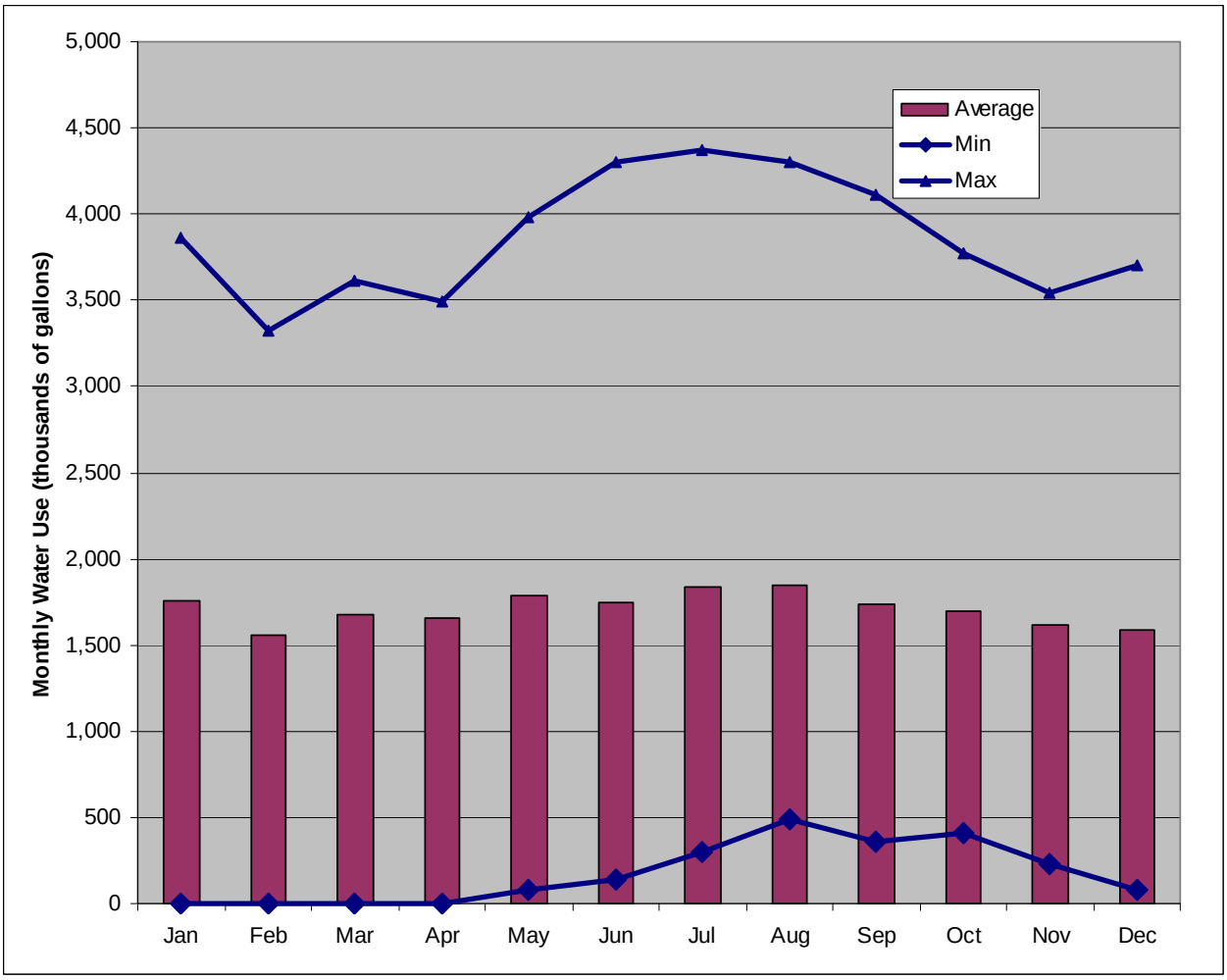

Figure 8 - EPPING WATER WORKS - FREMONT ROAD WELL - Monthly Water Use (1992-2012)

Table 7 – Epping WW - Fremont Road Well - Monthly Water Use Statistics (1992-2012)

	Low	High	Average
Thousands of Gallons	-	44,135	20,501
cfs	-	0.1871	0.0869
cfsm at Packers Falls Gage	0.00000	0.00102	0.00047

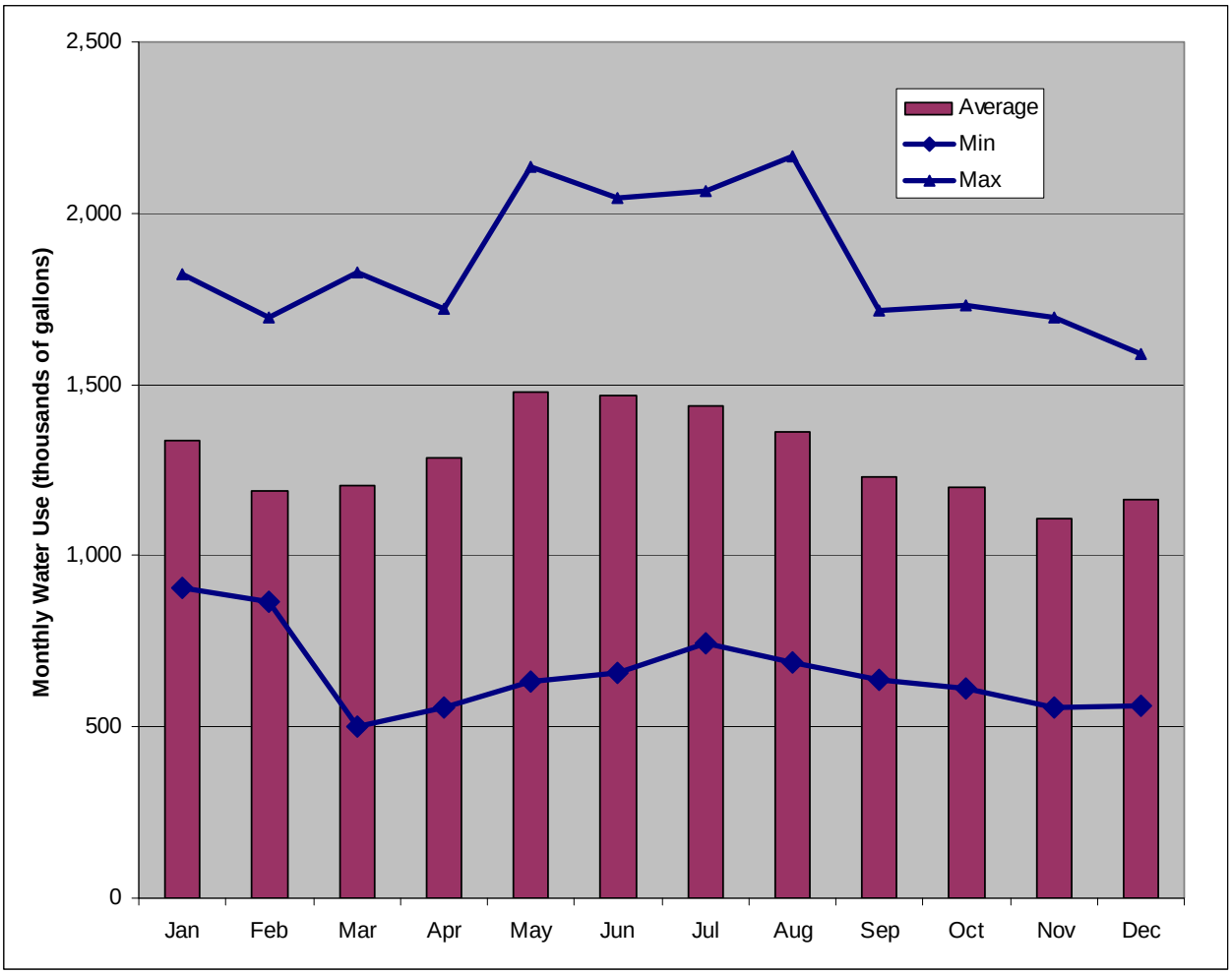

Figure 9 - EPPING WATER WORKS - HOAR POND WELL 1 (20045-S02) Monthly Water Use (2001-2012)

Table 8 - Epping WW - Hoar Pond Well 1 - Monthly Water Use Statistics (2001-2012)

	Low	High	Average
Thousands of Gallons	499	2,166	1,288
Cfs	0.0254	0.1102	0.0655
cfsm at Packers Falls Gage	0.00014	0.00060	0.00036

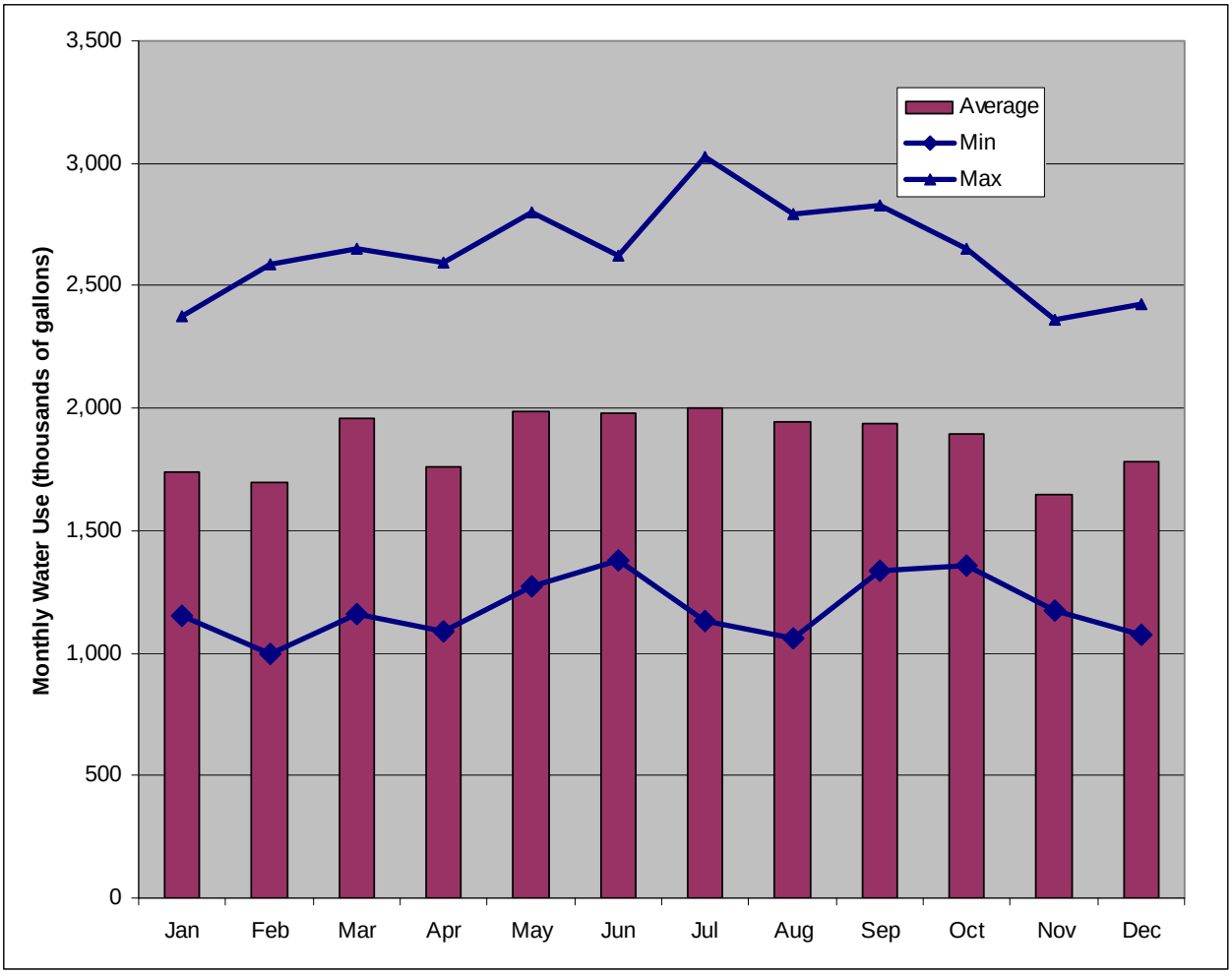

Figure 10 - EPPING WATER WORKS - HOAR POND WELL 2 (20045-S04) Monthly Water Use (2005-2012)

Table 9 - Epping WW - Hoar Pond Well 2 – Monthly Water Use Statistics (2005-2012)

	Low	High	Average
Thousands of Gallons	997	3,028	1,861
cfs	0.0507	0.1540	0.0947
cfsm at Packers Falls Gage	0.00028	0.00084	0.00052

Env-Wq 2101 Requirements for Water Conservation Plans

Development and approval of a water conservation plan that meets the Water Conservation Rules requirements will satisfy the Conservation Plan requirements under the Instream Flow Rules. The Conservation Rules require different activities depending on the type of water use. Conservation plans for public water supplies require inclusion of the following components:

- Installation, maintenance, and use of appropriately selected meters;

- Maintaining low levels of unaccounted-for water;
- Performing water audits to assess losses;
- A comprehensive plan for leak detection surveys of the distribution system;
- System pressure reduction where necessary;
- A water conservation educational outreach initiative;
- Adopting a rate structure that promotes water conservation; and,
- On-going water conservation compliance reporting.

So long as Epping Water Works is in compliance with their Water Conservation Plan through DES Groundwater and Drinking Water Bureau, they are meeting the water conservation plan requirements of the Instream Flow Program.

Existing Water Conservation Measures

Epping Water Works submitted a proposed Water Conservation Plan in 2010 to DES's Drinking Water and Groundwater Bureau in support of its permit application for the development of the new Hoar Pond Well No. 3. A revised version of the Water Conservation Plan (Geosphere Environmental Management, Inc. 2010) was approved by DES February 3, 2011 under Env-Wq-2101. The approved Water Conservation Plan meets the requirements for a water conservation plan under the Instream Flow Program.

The approved Water Conservation Plan documents the water conservation measures employed by Epping Water Works and how its operations meet the water conservation requirements for existing Large Community Water Systems pursuant to Env-Wq 2101. A copy of the revised Water Conservation Plan is included as an attachment to this document and some of the features of the approved Water Conservation Plan are described below.

All public sector water users, private water users and the water sources are metered. The meters are sized in accordance with the specifications of the manufacturer. The meters were selected, installed and are maintained in accordance with the procedures and protocols described in "Manual of Water Supply Practices Water Meters – Selection, Installation, Testing, and Maintenance" (AWWA 1999). The water meters at the Hoar Pond wells have been calibrated each year, while the commercial and residential water meters had not been tested or calibrated as of 2010. The public and private water user meters are read on a quarterly basis, while the water source meters are read on a daily basis.

A leak detection survey and water audit was performed in 2004 and no leaks were detected at that time. The water distribution system was also independently assessed for unaccounted losses by the Granite State Rural Water Association, that same year, and determined net losses to be less than five percent of total production. Epping estimated that in 2009 unaccounted-for water represented 9 percent of the water distributed (44 million gallons pumped versus 40 million gallons of metered water use). Beginning in 2011, Epping proposed to implement a program to check for leaks within the distribution system, which will involve a 20 percent system leak detection check per year. As a result, every five years the complete distribution system will have been surveyed for leaks. The first three year compliance report is due in 2014.

As noted in the Water Conservation Plan (Geosphere Environmental Management, Inc. 2010) the water system has pressures of 70 pounds per sq. inch (psi) and lower. The recommended working range for water pressure is 60 to 80 psi. A reduction in water pressure below the present values may reduce the ability to provide flow for fire suppression in certain areas of the system.

Epping Water Works charges its residential and commercial customers a flat rate for water use, with commercial customers paying a slightly higher rate. It also charges a quarterly fee, which is applied to every 50,000 gallons used. Water users consuming more than 50,000 gallons per quarter pay a higher total amount based on their water use. The Town of Epping also requires low flow fixtures for new homes and businesses, and it requires that any new irrigation systems be designed by a certified installer and approved by the Water and Sewer Commission.

The Epping Board of Water Commissioners actively performs public outreach to educate water users on water conservation issues. These efforts include discussion of water conservation issues at its meetings and the posting of notices in the local newspaper. Conservation issues are also discussed during the monthly televised water and sewer commission meeting. Water conservation educational materials are occasionally included in the bills sent to water users quarterly.

Water Conservation Alternatives and Costs

The approval of the attached Water Conservation Plan (Geosphere Environmental Management, Inc. 2010) by the DES Drinking Water and Groundwater Bureau meets the Instream Flow Program's Conservation Plan requirements. The Water Conservation Plan will be administered by the Drinking Water and Groundwater Bureau under its existing authority or the authority of the Instream Flow Program. A Water Conservation Plan was required for the development of a new water source and so there are no additional costs attributed to the Lamprey River Water Management Plan.

Conservation Implementation Schedule

The Town will continue to implement its Water Conservation Plan (Geosphere Environmental Management, Inc., February 3, 2011). The first three-year compliance report from Epping to the DES Drinking Water and Groundwater Bureau is due in 2014.

Water User Contact Information

Water User: Epping Water Works
Address: 157 Main Street, Epping, NH 03042
Contact: Dennis Koch, Water and Sewer Administrator
Phone: 679-5441 ext. 108
Email: waterandsewer@townofepping.com

Conversion Factors for Volume and Flow Units

1	cubic foot =	7.481	gallons
1	gallon =	0.1337	cubic feet
1	acre-foot =	43,560	cubic feet
1	acre-foot =	325,872	gallons
1	cfs =	448.86	gpm
1	cfs =	646,358.4	gpd
1	cfs =	0.65	MGD
1	gpm =	0.002227866	cfs
1	gpd =	0.00000154713	cfs
1	MGD =	1.5471	cfs

Sources of Information

Env-Wq 1900 Rules for the Protection of Instream Flow on Designated Rivers.

Env-Wq 2101 Water Conservation Rules, adopted 5/12/05.

American Water Works Association. 1999. Water Meters – Selection, Installation, Testing and Maintenance. AWWA Manual M6, Fourth Edition.

Department of Environmental Services (DES) 2009a. Effects of Well Withdrawal Impacts on Lamprey Stream Flow. NHDES-R-WD-09-5. Prepared by Normandeau Associates, Inc., Rushing Rivers Institute and the University of New Hampshire.

Department of Environmental Services (DES) 2009b. Final Lamprey Protected Instream Flow Report. Prepared by Normandeau Associates, Inc., Rushing Rivers Institute and the University of New Hampshire. NHDES-R-WD-08-26.

Geosphere Environmental Management, Inc. 2010. Revised Water Conservation Plan for Town of Epping Water and Sewer Department. Dated December 1, 2010.

Survey of Lamprey River Affected Water Users performed by Normandeau Associates, Inc. completed by Dennis Koch, Epping Water Works.

Personal communication with Dennis Koch, Epping Water Works.

Personal communication with Norm Dionne, Epping Water Works.

Water use reports on file with the Department of Environmental Services (DES).

Attachment

Revised Water Conservation Plan
Town of Epping Water and Sewer Department

GEOSPHERE
ENVIRONMENTAL MANAGEMENT INC.

51 Portsmouth Avenue, Exeter, NH 03833
tel: 603-773-0075 *fax*: 603-773-0077
www.geospherenh.com

MEMORANDUM OF TRANSMITTAL

DATE: 12/1/2010
PROJECT: 08204

TO: Mr. Derek Bennett
NHDES-DWGB
P.O. Box 95
Concord, NH 03302

RE: Town of Epping Water and Sewer Dept.
Revised Water Conservation Plan
Hoar Pond Well No. 3
Epping, NH

CC: Dennis Koch, Town of Epping Water and Sewer Dept., 157 Main St., Epping, NH 03042
Cliff Sinnott, Rockingham Planning Commission, 156 Water St., Exeter, NH 03833
Karen Falcone, Epping Board of Selectmen, Town Hall 157 Main St., Epping, NH 03042

ENCLOSED – THE FOLLOWING:

COPIES	DATE	DESCRIPTION
1	12/1/2010	Revised Proposed Water Conservation Plan Epping Water and Sewer Department

REMARKS:

Enclosed please find the Revised Proposed Water Conservation Plan for the Epping Water and Sewer Department. This enclosure has been sent to the Rockingham Planning Commission and the Epping Board of Selectmen via certified mail. Return receipts will be forward to you when returned. A copy was also sent to the Epping Water and Sewer Department. Please feel free to contact me with any questions.

Abigail Thompson
Submitted By

GEOSPHERE
ENVIRONMENTAL MANAGEMENT INC.

December 1, 2010

Derek S. Bennett
Water Use and Conservation
Drinking Water and Groundwater Bureau
New Hampshire Department of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Re: Revised Proposed Water Conservation Plan
Town of Epping Water and Sewer Department

Dear Mr. Bennett:

Geosphere Environmental Management, Inc. (GEOSPHERE) on behalf of the Epping Water and Sewer Department has prepared this Revised Proposed Water Conservation Plan for the proposed Large Groundwater Withdrawal identified as Hoar Pond Well No. 3 (*Attachment A*). A previous Proposed Water Conservation Plan was submitted to the New Hampshire Department of Environmental Services on November 7th, 2008. This submittal has been prepared to clarify actions currently taken or proposed to be implemented by the Epping Water and Sewer Department in accordance with the New Hampshire Department of Environmental Services (NHDES) Administrative Rules (rules) Env-Ws 390.05 and the subsequent Env-Wq 2101.05 Water Conservation Rules – Requirements for Existing Large Community Water Systems.

As required by Env-Wq 2101.11, a copy of the Revised Proposed Conservation Plan and the NH DES prepared summary of Env-Wq 2101 rules (*Attachment B*) has be sent via certified mail to the governing board of the Town of Epping and the Rockingham Regional Planning Commission for review and to promote water conservation practices within the service area and neighboring towns of the new water system.

Sincerely,
GEOSPHERE ENVIRONMENTAL MANAGEMENT, INC.

Raymond W. Talkington, Ph.D., P.G., LSP
Principal Hydrogeologist

Abigail Thompson
Project Hydrogeologist

Cc: Karen Falcone, Epping Board of Selectmen, Town Hall, Epping, NH 03042
Cliff Sinnott, RPC, 156 Water St., Exeter, NH 03833
Dennis Koch, Town of Epping Water and Sewer Dept., 157 Main St., Epping, NH 03042

51 PORTSMOUTH AVENUE, EXETER, NEW HAMPSHIRE 03833
Telephone: 603-773-0075 Fax: 603-773-0077
www.geospherenh.com

Attachment A

Revised Proposed Water Conservation Plan

SYSTEM DESCRIPTION/DESCRIPTION OF NEED

The Town of Epping Water and Sewer Department (EWSD) currently has 3 bedrock wells to supply water to its municipal water users; #503 Fremont Well, #504 Hoar Pond Well No. 1, and # 505 Hoar Pond Well No. 2. The system has 420 connections that supplies water to a population of 1,050 residents.

In recent years, rapid development has occurred in the town along the Routes 125 and 27 corridors. New development, coupled with population growth has led to increased demand on the system. They are unable to buy water from nearby towns of Brentwood and Exeter. It is anticipated that demand will continue to rise as the population in Epping increases. A new source will be needed to maintain supply to an increasing number of municipal water users. The average existing use is 0.110 mgd. During times of peak demand, water use goes up to 0.160 mgd. It is anticipated that in the next 10 years the average daily demand will be 0.220 mgd and during peak demand, the average withdrawal rate may be as high as 0.350 mgd. Typically the wells are pumped 13-15 hours per day however during peak demand in summer the wells may be pumped longer. The town reduces stress from peak demand by storing water in 2 elevated tanks. One tank has a 300,000 gallon storage capacity, the other tank has 200,000 gallon storage capacity.

This Water Conservation Plan is made in accordance with New Hampshire Department of Environmental Services (NHDES) Administrative Rules (rules) Env-Ws 390.05 and the subsequent Env-Wq 2101.05 Water Conservation Rules – Requirements for Existing Large Community Water Systems.

TOWN OF EPPING WATER AND SEWER DEPT. WATER CONSERVATION PLAN

Env-Wq 2101.05 Requirements for Existing Large Community Water Systems.

A. An existing large community water system shall implement the measures described in this section.

B. Each large community water system shall install water meters within 3 years of obtaining approval for a new source of water that is subject to RSA 485:3 for all of the following:

1. Public sector water users except firefighting;
2. Private water users; and
3. All sources of water.

Epping Water and Sewer Department currently meters all customers and all sources.

C. The water system shall size the water meters required by (**B**), above, in accordance with the specifications of the manufacturer.

All meters are sized in accordance with the specifications of the manufacturer

D. In selecting, installing, and maintaining water meters, the water system shall comply with procedures and protocols described in "Manual of Water Supply Practices, Water Meters-Selection, Installation, Testing, and Maintenance," document identification number AWWA M6, American Water Works Association, 1999.

All meters are selected, installed, and maintained with the procedures and protocols described in "Manual of Water Supply Practices, Water Meters- Selection, Installation, Testing, and Maintenance" document identification number AWWA M6 American Water Works Association, 1999. Epping Water and Sewer Department will test and calibrate all source meters on an annual basis. Epping Water and Sewer Department has implemented a replacement program for service meters, replacing 5-10% of service meters a year, as well as any others in need of replacement.

E. The water system shall read the water meters required by **(B)(1)** and **(2),** above, at least once every 90 days.

Epping Water and Sewer Department currently reads all private water user meters and all public sector meters on a quarterly basis and will continue to do so.

F. The water system shall read the water meters required by **(B)(3),** above, at least once every 30 days.

Epping Water and Sewer Department currently reads all water source meters on a daily basis and will continue to do so.

G. The water system shall implement a water audit and leak detection program in Accordance with "Manual of Water Supply Practices, Water Audits and Leak Detection" document identification number AWWA M36, American Water Works Association, 1999, within one year of obtaining approval for a new source of water.

Epping Water and Sewer Department will use a qualified subcontractor to conduct their water audit and leak detection program in accordance with the "Manual of Water Supply Practices, Water Audits and Leak Detection" document identification number AWWA M36, American Water Works Association, 1999. Beginning in 2011, Epping Water and Sewer Department will implement a program to check for leaks within the distribution system. This program will involve a 20% system leak detection check per year. Therefore, every five years the complete distribution system will have been surveyed for leaks.

H. The water system shall repair all leaks identified by the activities required by **(G)** within 60 days of discovery unless a waiver is obtained in accordance with **Env-Ws 390.09.**

Epping Water and Sewer Department will repair all leaks discovered during water audits and leak detection within 60 days.

I. The water system shall estimate the volume and percentage of unaccounted-for water in the water system once every year using protocols and procedures described in Manual of Water Supply Practices, Water Audits and Leak Detection" document identification number AWWA M36, American Water Works Association, 1999.

Epping Water and Sewer Department will continue to use a qualified subcontractor to estimate the volume and percentage of unaccounted-for water using protocols and procedures described in "Manual of Water Supply Practices, Water Audits and Leak Detection" document identification number AWWA M36, American Water Works Association, 1999. It is estimated that Epping Water and Sewer Department had approximately 9% of unaccounted for water in 2009. In 2009 the source meters registered approximately 44 million gallons of groundwater withdrawn, the net of all service meters registered approximately 40 million gallons of water used.

J. The water system shall prepare and submit a response plan to the department within 60 days if the percentage of unaccounted-for water in the water system calculated pursuant to **(I)**, above, exceeds 15% of the total volume of water introduced to the water system.

Epping Water and Sewer Department will submit a response plan to NH DES within 60 days if the percentage of unaccounted-for water in the system exceeds 15%.

K. The response plan prepared in accordance with **(J),** above, shall identify how the water system intends to reduce the percentage of unaccounted-for water to below 15% within 2 years, except for leaks that have been identified which must be repaired in accordance with paragraph **(H).**

The response plan will identify actions the Epping Water and Sewer Department will take to reduce the percentage of unaccounted-for water to below 15% within 2 years, excluding the repair of leaks identified during leak detection.

L. The department shall approve the response plan within 90 days if it contains recommended actions that comply with the requirements specified in **(K),** above.

M. The water system shall implement the response plan in accordance with the approved schedule upon receiving approval from the department.

Upon approval from the NH DES, Epping Water and Sewer Department will implement the response plan in accordance with the approved schedule.

N. The water system shall implement pressure reduction within one year of obtaining approval of a new source of water when:

1. Technically feasible;
2. Consistent with water system industry standards and regulations; and
3. Consistent with other public health and safety considerations.

At this time, the water system has pressures of 70 psi and lower. Reducing pressures even more may threaten fire flow in certain areas of the system. It is not technically feasible to reduce pressures anywhere in the system within one year of obtaining approval of a new source.

O. The water system shall adopt a rate structure that promotes water conservation within 5 years of obtaining approval for a new source of water, as described below:

1. The rate structure shall be based on:
   a. A unit price of water; and
   b. The amount of water used by each connection to the water system; and

2. The unit price of water for residential customers shall:
   a. Remain the same; or
   b. Increase with the volume of water consumed.

Currently, the Epping Water and Sewer Department's water rate structure is based on metered water consumption using inverted block rates. The Epping Water and Sewer Department will continue to evaluate rate structures for effectiveness in promoting water conservation.

P. The water system shall complete a water conservation educational outreach initiative using materials prepared by the department as follows:

1. The water system shall implement the applicable public notification and outreach requirements to municipal governments within its service area in accordance with **Env-Wq 2101.11**; and

Epping Water and Sewer Department will implement public notification and outreach to the Town of Epping municipal government within the Epping Water and Sewer Department service area in accordance with Env-Ws 390.11.

2. The water system shall implement an educational outreach initiative for its customers to promote water conservation immediately upon obtaining approval for the new source.

The Epping Water and Sewer Department currently implements a variety of water conservation efforts to reduce demand. On a yearly basis, Epping Water and Sewer Department includes the NH DES-prepared water conservation educational materials in water bills that are mailed to water users. In addition, the Epping Board of Water Commissioners regularly holds meetings with the public to educate water users on water

conservation issues, particularly lawn watering. The Epping Water Commission also posts notices in the local newspaper that discuss water conservation. Conservation issues are also discussed during the monthly-televised water and sewer commission meeting. Water efficiency efforts are also being undertaken by other departments in the town to reduce consumption. The planning board is requiring all new construction utilize water-conserving low-flow fixtures, these fixtures are required to have an energy star rating for water consumption. All proposed irrigation systems must be designed by a certified installer. All irrigation plans are reviewed for uniformity and conservation (e.g. rain sensors are required) prior to being approved by the Epping Water Commission. The Epping Water and Sewer Department intends to continue these efforts to promote water conservation after obtaining approval for the new source.

Q. Activities completed in accordance with **(B)** through **(P),** above, shall be completed by water system personnel under the supervision of a certified operator pursuant to **Env-Ws 367.**

The water conservation activities described in **(B)** through **(P)** will be completed by water system personnel under the supervision of a certified operator pursuant to Env-Ws 367.

Attachment B

Summary of Env-Wq 2101

-Water Conservation Rules-
Env-Wq 2101 (formerly Env-Ws 390)

Applicants applying for permits to develop new sources of water need to be aware that they are subject to new water conservation requirements required by RSA 485.61 which became law in July 2002. The law requires that the Department of Environmental Services (Department) adopt and administer water conservation rules for applicants developing the following type of new water sources:

1. New sources of groundwater for community water systems subject to RSA 485:3;

2. New sources of groundwater for bottled and bulk water operations subject to RSA 485:3;

3. New sources of groundwater that exceed 57,600 gallons over any 24-hour period subject to RSA 485-C; and

4. New sources of surface water associated with projects that require a water quality certification pursuant to Section 401 of the Federal Clean Water Act.

The Department met with an advisory committee consisting of representatives of municipalities, community water systems, environmental organizations, and business and industry to develop the water conservation rules. The rules were formally adopted by the Department in May 2005.

A general summary of the requirements of the water conservation rules is provided below.

Requirements for All Large Community Water Systems and All New Small Community Water Systems Developing New Sources of Water

1. Install and maintain meters for all water withdrawals and service connections.

2. Implement a water audit, leak detection and leak repair program in accordance with the "Manual of Water Supply Practices, Water Audits and Leak Detection", document identification number AWWA M36, American Water Works Association, 1999.

3. When applicable, development and implementation of response plans to reduce unaccounted for water to less than 15%.

4. Implement a rate structure that encourages efficient water use.

5. Implement a water conservation educational outreach initiative.

Requirements for Existing Small Community Water Systems Developing New Sources of Water

1. Either: a) Install source and service connection meters and implement a water audit, leak detection and leak repair program in accordance with the "Manual of Water Supply Practices, Water Audits and Leak Detection", document identification number AWWA M36, American Water Works Association, 1999; **or** b) Complete a system-wide leak detection once every two years.

2. Repair all leaks within 60 days of identification.

3. Implement a water conservation educational outreach initiative.

Requirements for Applicants Developing New Sources of Water for Industrial, Commercial, or Institutional Water Uses

1. Install water meters for all water sources.

2. Retrofit or replace single pass water-cooling systems when feasible based upon an economic analysis that includes a four-year payback period.

3. Install controls to stop the overflow or discharge of water to waste when feasible based upon an economic analysis that includes a four-year payback period.

4. Identify water conservation best management practices or best available technologies that may be applicable to the types of water-using processes at the subject facility, and implement these measures when feasible based upon an economic analysis that includes a four-year payback period.

5. For all new lawn areas, install six (6) inches of loam and devices to shut-off automatic irrigation systems when not needed.

For more information about the water conservation rules, contact Derek Bennett at 271-6685 or derek.bennett@des.nh.gov.

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Karen Foltore
Epping Board of Selatmen
157 Main Street
Epping, NH 03042

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Jayce A Blanchard ☐ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery
Joyce A Blanchard 12-2-10

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If YES, enter delivery address below: ☒ No

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Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.32

EXETER NH 03833 Postmark Here DEC 1 2010

Sent To Karen Foltore, Epping Board of Selectmen
Street, Apt. No.; or PO Box No. 157 Main Street
City, State, ZIP+4 Epping NH 03042

PS Form 3800, August 2006 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Cliff Sinnott
Rockingham Planning Commission
156 Water Street
Exeter, NH 03833

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Roxanne M Bines ☐ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery
Roxanne M Bines 12/2/10

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☒ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2560 0002 6495 9765

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

CONSERVATION PLAN

Raymond Water Department (#20061)

Introduction

Conservation plans under the Instream Flow Program require meeting the conservation measures and best management practices in the Department of Environmental Services (DES) Water Conservation Rules (Env-Wq 2101). Use of these measures and practices as a standard will provide a common level of effort by all water users.

The Raymond Water Department provides domestic water for the Town of Raymond, New Hampshire. The water supply is sourced from three overburden wells located in the Town of Raymond on town-owned property adjacent to the Lamprey River. This Conservation Plan applies to the entire Raymond Water Department service area.

Water Source and Uses

Although the Raymond Water Department has three active stratified drift wells as sources for its water supply, until September 2010, it reported its total water use to DES as a wellfield under a single registration number (20061-S01). A fourth well located in the center of town is no longer used. Each of the wells has been assigned an identification number by the United States Environmental Protection Agency (USEPA). Table 1 identifies the Raymond water sources by their EPA ID numbers and by their NH water user registration numbers.

Table 1 – Well Names and Identification Numbers

Well Name	EPA ID Number	NH Water User Registration Number
Well #1	1971010-002	20061-S02
Well #2	1971010-003	20061-S03
Well #3	1971010-004	20061-S04
unused well	1971010-001	--

Figure 1 depicts the locations of these wells designated by their EPA ID numbers. The three wells are located in a stratified drift formation near the Lamprey River. Well #1 is located 281 feet from the Lamprey River, Well #2 is located 231 feet from the river, and Well #3 is located 249 feet from the river (Figure 1). An analysis of these wells showed that they do not induce recharge from the Lamprey River at their average or maximum reported extraction rates (DES 2009a). However, these wells intercept water that would be flowing toward the Lamprey River. Water is used by the Raymond Water Department customers and then returned to the environment by way of individual septic systems in the town.

Usage of the wells alternates on a monthly basis. The Town's water system includes 1.3 million gallons of storage in three surface tanks (one 110,000 gallon and two 600,000 gallon) to supplement the wells during periods of peak demand. The Raymond Water Department

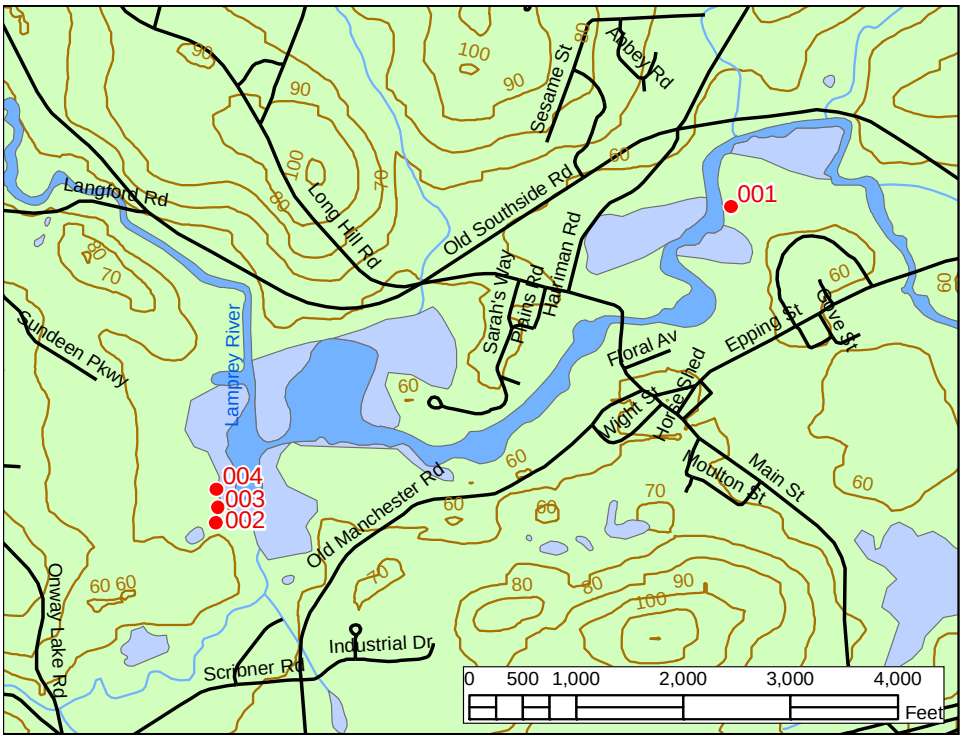

Figure 1 - Location of the Raymond Water Department water supply wells.

wells are located upstream of the Designated River; therefore the drainage area of the impact point of the withdrawal on the Designated River is equal to the drainage area at the head of the Designated River, which is 152.5 sq. mi.

Water Use Patterns

Water is withdrawn at rates occurring in a pattern common to municipal water supplies. Daily withdrawal rates are moderated by system storage. Water demand follows a typical diurnal pattern. The wells are pumped at an equal withdrawal rate. When pumping exceeds demand, excess water fills the distribution system storage, and, when pumping is less than demand, stored water makes up the difference. The pumping rates of the wells are variable and are set by the operators to operate approximately 20 hours per day. Depending on if the Town is operating one, two or all three wells at a time, the individual rates can range from 100 to 400 gallons per minute (gpm). Each well is metered and the total production is recorded daily. Monthly water use is reported quarterly to DES.

Water use data for the Raymond Water Department well field for the years of 1988 through 2013 are summarized in the figures and tables below. Complete years of monthly data from 1989 to 2012 were used to develop annual and monthly statistics. Individual well use information was not available until 2010, as the Town reported the three wells as a single wellfield until September 2010. Annual water use data were converted from thousands of gallons to cubic feet per second (cfs) and cubic feet per square mile of drainage area (cfsm) to make comparisons with stream flow values in the Lamprey Designated River.

Between 1989 and 2012 annual water use by the Raymond Water Department ranged from a high of 121.88 million gallons (2009) to a low of 76.04 million gallons (1990), with an average annual use of 99.78 million gallons (Figure 2 and Table 2). Overall, annual water use has increased over these 24 years (1989 to 2012), briefly reset by short periods of reduced water use after 1998, 2003 and 2010. During this period, annual water use increased by 26.10 million gallons or 33.25 percent. This represents an average increase of 1.087 million gallons per year or 1.4 percent per year for the 24 year period of record.

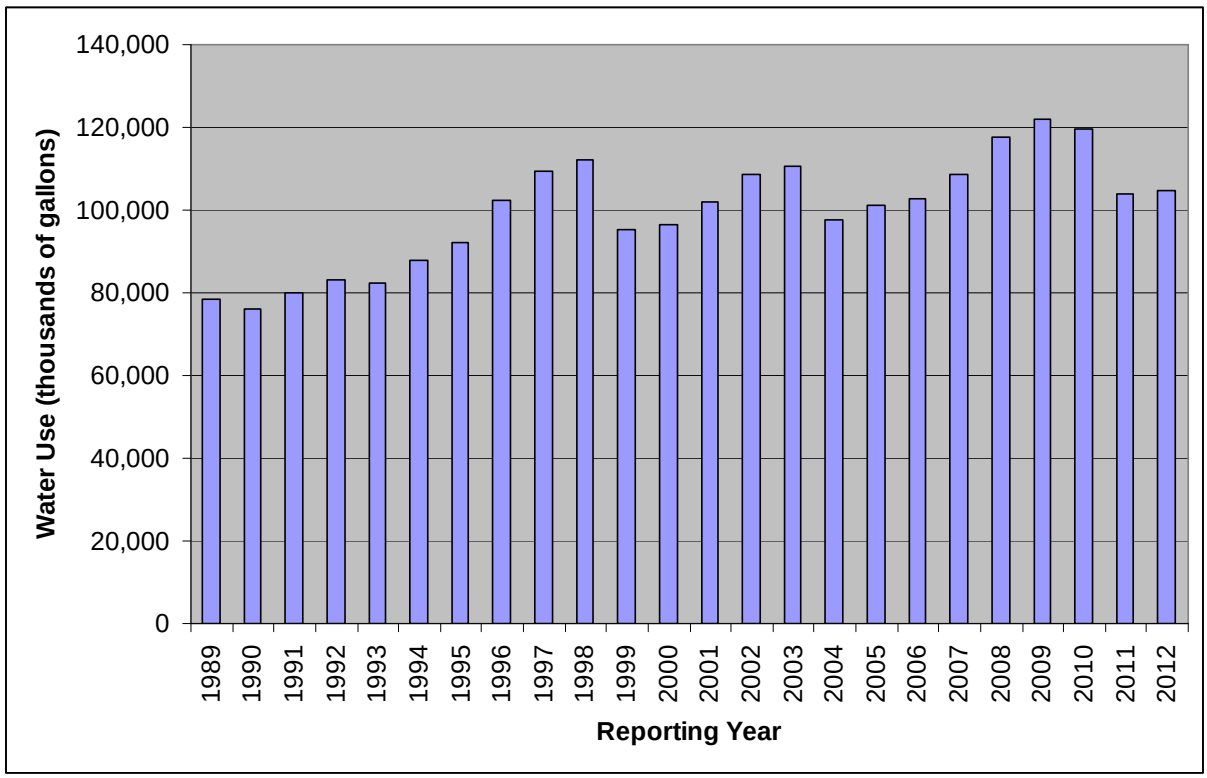

Figure 2 – RAYMOND WATER DEPARTMENT (20061) - Annual Water Use

Table 2 – Raymond Water Department - Annual Water Use Statistics (1989 - 2012)

	Low	High	Average
Thousands of Gallons	76,039	121,884	99,784
cfs	0.3224	0.5167	0.4230
cfsm at Packers Falls Gage	0.00176	0.00282	0.00231

Monthly water use varies in response to weather conditions and changes in seasonal demand. The average monthly water usage was highest during summer and lowest during winter (Figure 3). This seasonal pattern reflects increased outdoor water usage (lawn irrigation, garden watering, vehicle washing, etc.) during the summer months, which then declines during the fall, remains low during the winter and begins to increase again in the spring. The highest total monthly water usage was 12.48 million gallons (July 1997). The lowest total monthly

water usage was 4.23 million gallons (November 1989), while the average monthly water use was 8.315 million gallons (Table 3).

The monthly use data were converted to cubic feet per second (cfs) by dividing the monthly values by days per month and multiplying them by a flow unit conversion factor. Daily water use by the Raymond Water Department ranged from a minimum of 0.218 cfs (0.141 million gallons per day, November 1989) to a maximum of 0.623 cfs (0.403 million gallons per day, July 1997), with an average use of 0.423 cfs (0.273 million gallons per day) for the period of 1989 to 2012 (Table 3).

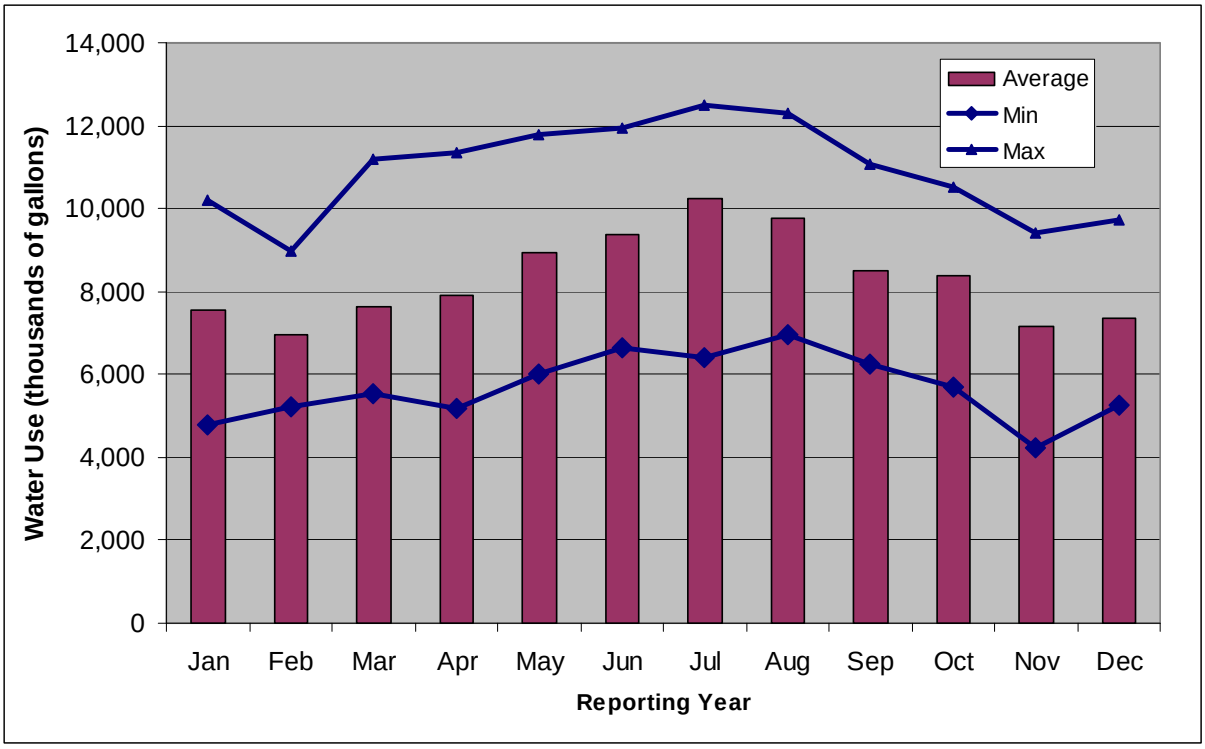

Figure 3 – RAYMOND WATER DEPARTMENT - Monthly Water Use Statistics (1989-2012)

Table 3 -Raymond Water Department - Monthly Water Use Statistics (1989 through 2012).

	Low	High	Average
Thousands of Gallons	4,232	12,483	8,315
cfs	0.2153	0.6350	0.4230
cfsm at Packers Falls Gage	0.00118	0.00347	0.00231

Env-Wq 2101 Requirements for Water Conservation Plan

Development and approval of a water conservation plan that meets the Water Conservation Rules requirements will satisfy the Conservation Plan requirements under the Instream Flow

Rules. The Water Conservation Rules require different activities depending on the type of water use. Conservation plans for public water supplies require inclusion of the following components:

- Installation, maintenance, and use of appropriately selected meters;
- Maintaining low levels of unaccounted-for water;
- Performing water audits to assess losses;
- A comprehensive plan for leak detection surveys of the distribution system;
- System pressure reduction where necessary;
- A water conservation educational outreach initiative;
- Adopting a rate structure that promotes water conservation; and,
- On-going water conservation compliance reporting.

The Raymond Water Department will be in compliance with the water conservation plan requirements of the Instream Flow Program by completing and obtaining approval of a Water Conservation Plan through DES Groundwater and Drinking Water Bureau.

Existing Water Conservation Measures

The Town of Raymond's Water Department has implemented most of the water conservation measures recommended by DES for water utilities (DES 1998) and as required in the state's Water Conservation Rules (Env-Wq 2101) for large community water systems. All water sources and users are metered. The production well meters are tested and calibrated every two years. System water meters are read monthly and water bills are mailed out quarterly. Water use is billed based on consumption, with the rate increasing with increasing use.

The Raymond Water Department continually looks for leaks, and monitors system records to identify anomalous water use. Leaks are repaired as soon as they are detected or reported. A leak detection survey in 2008 identified a 20 gallon per minute leak and another performed in 2013 identified two leaks with a combined rate of 18 gallons per minute. The Water Department also compiles a yearly pumped versus billed report to monitor unaccounted-for water. Based on the results of a recent assessment, unaccounted-for water was 19 percent, which is higher than the recommended maximum of 15 percent. In response, a leak detection study will performed in 2014.

The Raymond Water Department has several water conservation outreach initiatives. These include discussions and information dissemination with local groups (Boy and Girl Scouts, Planning Board and Board of Selectmen), bill stuffers, and through the Town's newsletter.

Water Conservation Alternatives and Costs

The Town of Raymond will document its existing water conservation activities and include a schedule for ongoing leak detection going forward from 2010 and a plan for responding to unaccounted-for water greater than 15%. Completion of this plan by the Town and approval by DES Drinking Water and Groundwater Bureau will meet the Instream Flow Program's

Conservation Plan requirements. The Water Conservation Plan will be administered by the Drinking Water and Groundwater Bureau under the authority of the Instream Flow Program.

The costs for the water conservation plan are to document the water conservation plan. Activities expected under the plan are currently ongoing in the service area.

If the Town needs to implement or maintain more restrictive water conservation measures due to diminished supply from its source(s) or storage, then those actions take precedent over this Conservation Plan. Nothing in this plan precludes the Town from further conservation actions on its own initiative.

Conservation Implementation Schedule

By June 1, 2014, the Town of Raymond will finalize a Water Conservation Plan as required by Env-Wq 1900 Rules for the Protection of Instream Flow on Designated Rivers. The water conservation plan will be in accordance with Env-Wq 2101 and will describe its existing water conservation activities and further include scheduling for its ongoing leak detection studies and a plan to repair leaks to maintain unaccounted-for water use to below 15 percent.

Water User Contact Information

Water User: Raymond Water Department
Address: 4 Epping Street, Raymond, NH 03077
Contact: Patrick Bower, Public Works Director
Phone: 895-4735 ext. 108
Email: pbower@raymondnh.gov

Conversion Factors for Volume and Flow Units

1	cubic foot =	7.481	gallons
1	gallon =	0.1337	cubic feet
1	acre-foot =	43,560	cubic feet
1	acre-foot =	325,872	gallons
1	cfs =	448.86	gpm
1	cfs =	646,358.4	gpd
1	cfs =	0.65	MGD
1	gpm =	0.002227866	cfs
1	gpd =	0.00000154713	cfs
1	MGD =	1.5471	cfs

Sources of Information

Env-Wq 2101 Water Conservation Rules, adopted 5/12/05.

Env-Wq 1900 Rules for the Protection of Instream Flow on Designated Rivers.

Department of Environmental Services (DES) 2009a. Effects of Well Withdrawal Impacts on Lamprey Stream Flow. NHDES-R-WD-09-5. Prepared by Normandeau Associates, Inc., Rushing Rivers Institute and the University of New Hampshire.

Department of Environmental Services (DES) 2009b. Final Lamprey Protected Instream Flow Report. Prepared by Normandeau Associates, Inc., Rushing Rivers Institute and the University of New Hampshire. NHDES-R-WD-08-26.

Survey of Lamprey River Affected Water Users performed by Normandeau Associates, Inc. completed by Dennis McCarthy, Town of Raymond.

Personal communications with Dennis McCarthy, Town of Raymond.

Personal communication with Denise O'Grady, Town of Raymond.

Water use reports on file with the Department of Environmental Services (DES).

CONSERVATION PLAN

Scenic Nursery & Landscaping (#20747)

Introduction

Conservation plans under the Instream Flow Program require meeting the conservation measures and best management practices in the Department of Environmental Services (DES) Water Conservation Rules (Env-Wq 2101). Use of these measures and practices as a standard will provide a common level of effort by all water users.

Scenic Nursery & Landscaping (Scenic Nursery) is located off Dudley Road, near the intersection of Route 27 and Route 107 in the northwest part of Raymond, New Hampshire. Scenic Nursery is a full service garden center and nursery, which also provides landscape design services. The business has been in operation at this location since 1997. The north and west portions of the property are located along the Lamprey River, which flows north to south past the property. This Conservation Plan applies to the entire Scenic Nursery and Landscaping Facility at Dudley Road.

Water Source and Uses

Scenic Nursery has three registered water sources on the property (Figure 1). The first source is a 15 foot deep dug well (20747-S01) which is encased in concrete, has a concrete cap and is located within 70 feet of the river. The second registered water source was a dug well (S02), but due to excessive siltation problems, this well is currently not used. In its place, an intake pump was placed in the river and the piping from the temporary intake ties into the irrigation system piping in the former dug well. The third water source (20747-S03) is a small pond located in the northwest portion of the property. The pond measures approximately 130 by 80 feet and 5 feet deep. The Scenic Nursery withdrawals are located upstream of the Designated River; therefore the drainage area of the impact point of the withdrawals on the Designated River is equal to the drainage area at the head of the Designated River; 152.5 sq. mi.

In response to a water use questionnaire, Scenic Nursery stated that the water obtained at these three sources was used to water annual plants in a greenhouse and approximately seven acres of container and field-grown nursery stock (trees and shrubs). Most of the watering is done by a drip irrigation system, but there is some blanket watering by spray irrigation of the container plants.

Water Use Patterns

Scenic Nursery's water withdrawals were first registered with the Department of Environmental Services (DES) in July 2001 and water use data are available for 2002 through 2012 (excepting 2009, for which no data area available). Water use is measured based on the pump-run time and is not directly metered. Water use occurs primarily during the spring through fall, with no reported water use during the winter (November through February). Water use is plant-need dependent and is largely affected by weather conditions (rainfall and air temperature). The greatest use of water is during dry periods in the growing season, during which water use can occur 24 hours a day, seven days a week. During these periods, automated watering occurs from 6 pm to 8 am, followed by manual watering from 8 am to 6 pm.

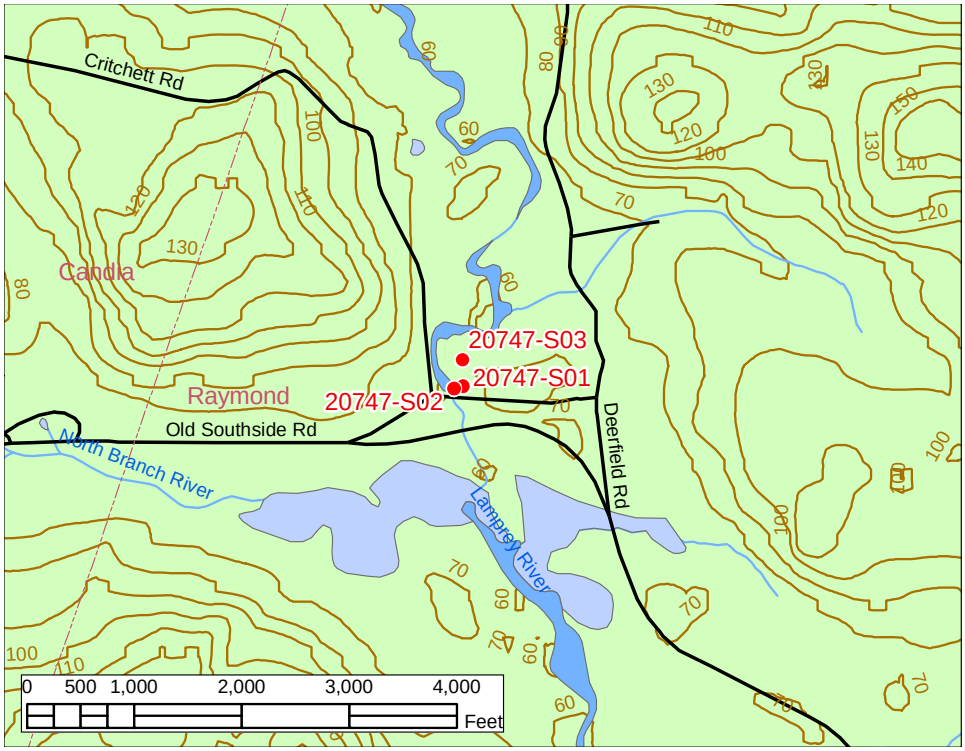

Figure 1 – Location of Scenic Nursery's registered water sources at Raymond, New Hampshire.

Water use data were obtained for Scenic Nursery for the years of 2002 through 2012, except for 2009, for which no data are available. The water use data came from the DES Water Use Registration database, and are summarized in the figures and tables below. Annual water use data were converted from thousands of gallons to cubic feet per second (cfs) and cubic feet per square mile of drainage area (cfsm) to make comparisons with stream flow values in the Lamprey Designated River.

Water use varies from year to year and month to month, depending primarily on weather. Annually, total usage has varied from a low of 0.370 million gallons (2004) to a high of 4.032 million gallons (2007), and average annual use has been 1.377 million gallons for the ten years of record (Figure 2 and Table 1). The principal sources of water have been well #1 (S01) and the pond (S03) (see Figures 3 through 5 and Tables 2 through 4). The high water use reported in 2002 reflects the drought conditions experienced in 2001 – 2002, while the high water use in 2007 reflects the recovery from the flood experienced during that April. According to the owner, most of the nursery stock was destroyed or washed away during the flood event and several years of product had to be replaced. New above ground nursery stock at the time required more watering by spray irrigation until they were replanted into more permanent containers with a pot-to-pot drip irrigation system. The significant decline in water use after 2007 reflects the reduced water use after the establishment of the new plant stock and the reduced reliance upon spray irrigation.

Between 2002 and 2012 total annual water use decreased by 2.685 million gallons or 82.6 percent. This represents an average decrease of 0.244 million gallons per year or 7.5 percent per year for the eleven year period of record. As shown in Figure 2, the year to year total annual water use can be highly variable. Excluding the 2002 drought year, the 2007 plant replacement year, and the 2009 "no-data" year, their annual average water use is 0.862 million gallons.

Scenic Nursery reduced their annual water use after 2009 by harvesting one of their field-grown plant fields and discontinuing its use. They also continued their efforts to reduce water usage through use of water efficient systems and reducing crop water requirements. This is likely to represent a common usage rate, although recent years' usage has stabilized at 0.567 million gallons (2010-2012).

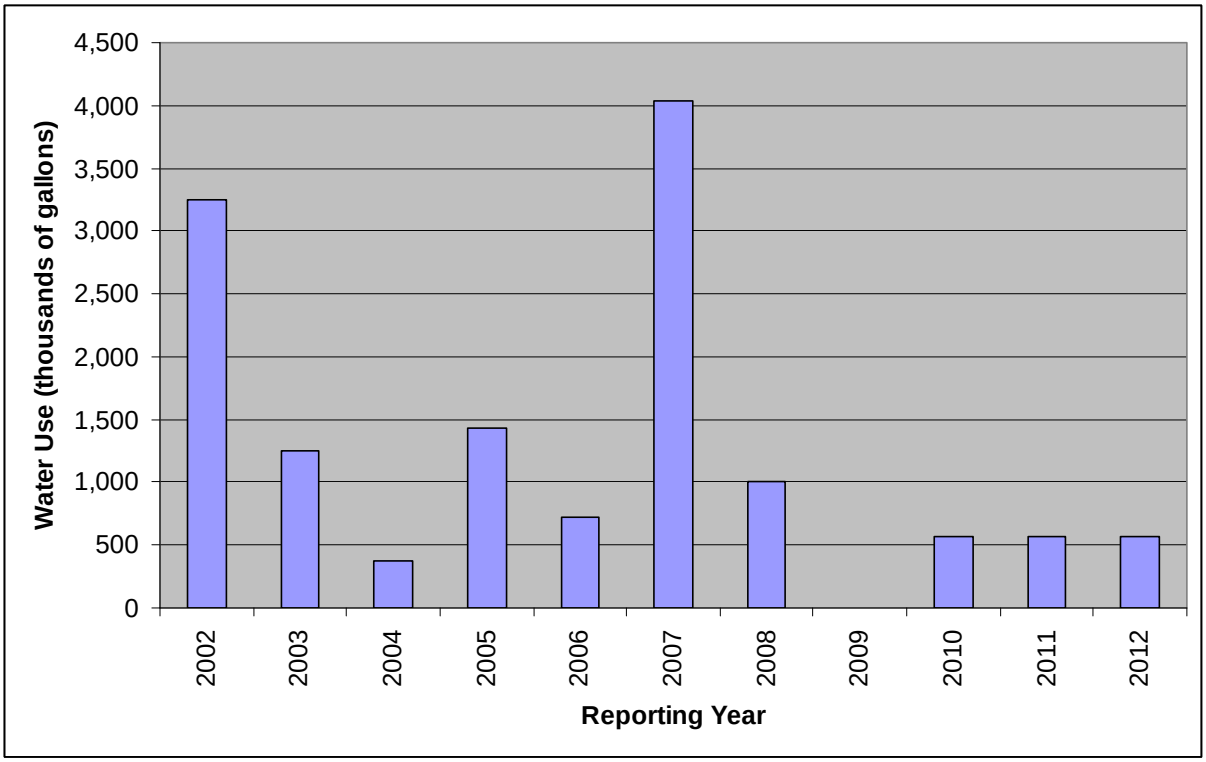

Figure 2 – SCENIC NURSERY (20747) - Annual Water Use (no data in 2009)

Table 1 – Scenic Nursery - Annual Water Use (2002 through 2012, no data in 2009)

	Low	High	Average
Thousands of Gallons	370	4,032	1,377
cfs	0.0016	0.0171	0.0058
cfsm at Packers Falls Gage	0.00001	0.00009	0.00003

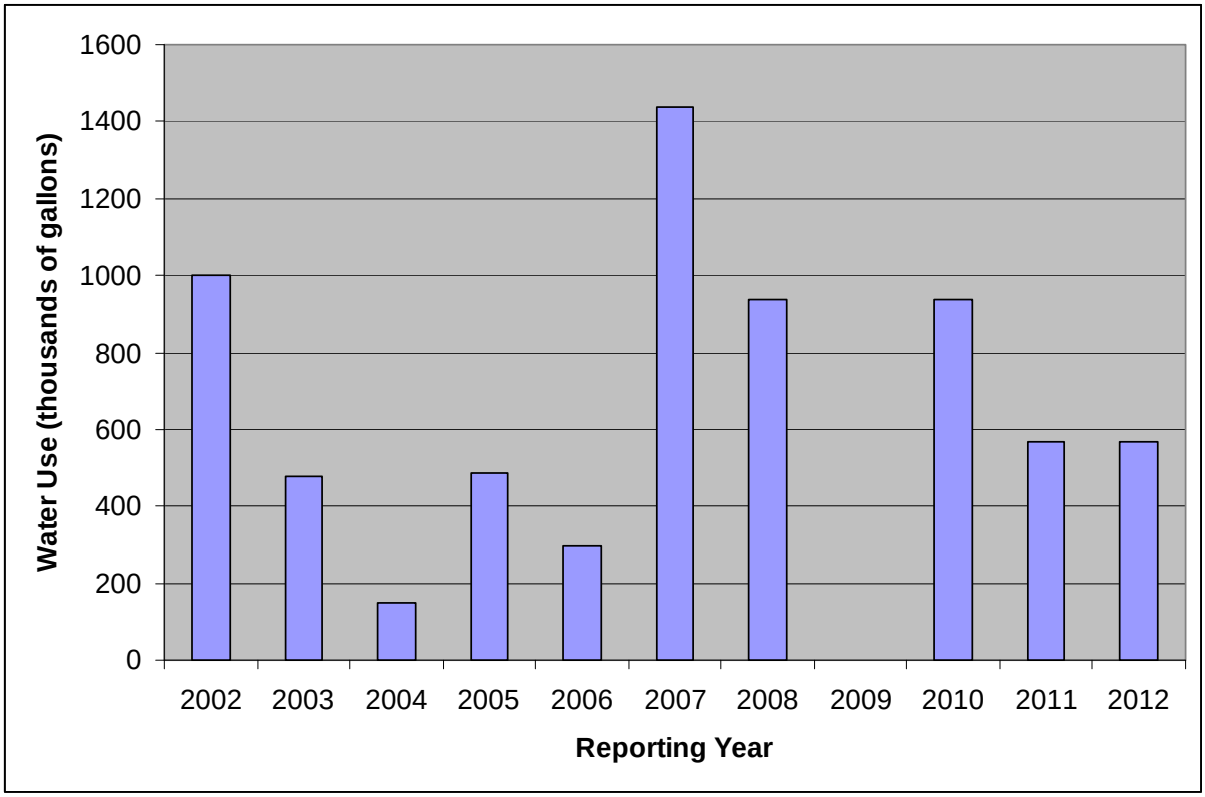

Figure 3 – SCENIC NURSERY - DUG WELL #1 (20747-S01) - Annual Water Use (no data in 2009)

Table 2 - Scenic Nursery - Dug Well #1 - Annual Water Use Statistics (2002 through 2012, no data in 2009)

	Low	High	Average
Thousands of Gallons	150	1,440	686
cfs	0.0006	0.0061	0.0029
cfsm at Packers Falls Gage	0.00000	0.00003	0.00002

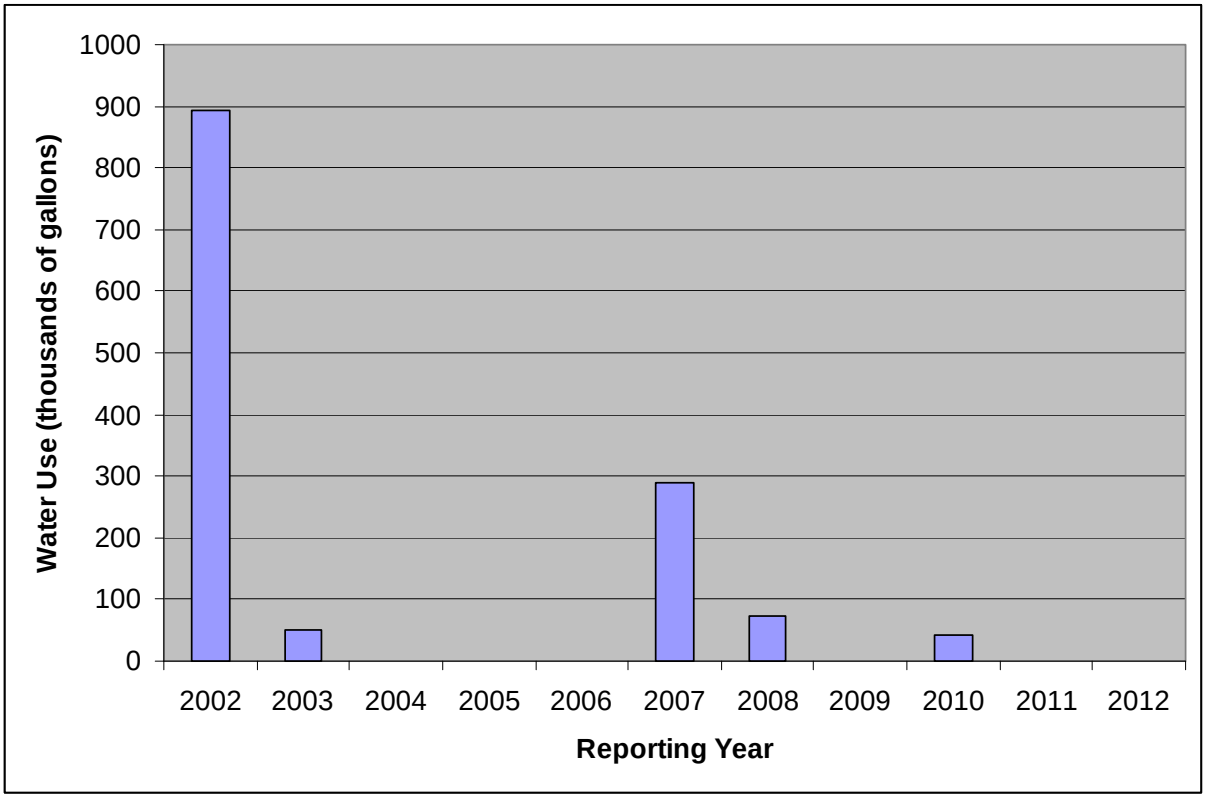

Figure 4 – SCENIC NURSERY - DUG WELL #2 (20747-S02) - Annual Water Use (no data in 2009)

Table 3 - Scenic Nursery - Dug Well #2 - Annual Water Use Statistics (2002 through 2012, no data in 2009)

	Low	High	Average
Thousands of Gallons	-	894	135
cfs	-	0.0038	0.0006
cfsm at Packers Falls Gage	0.00000	0.00002	0.00000

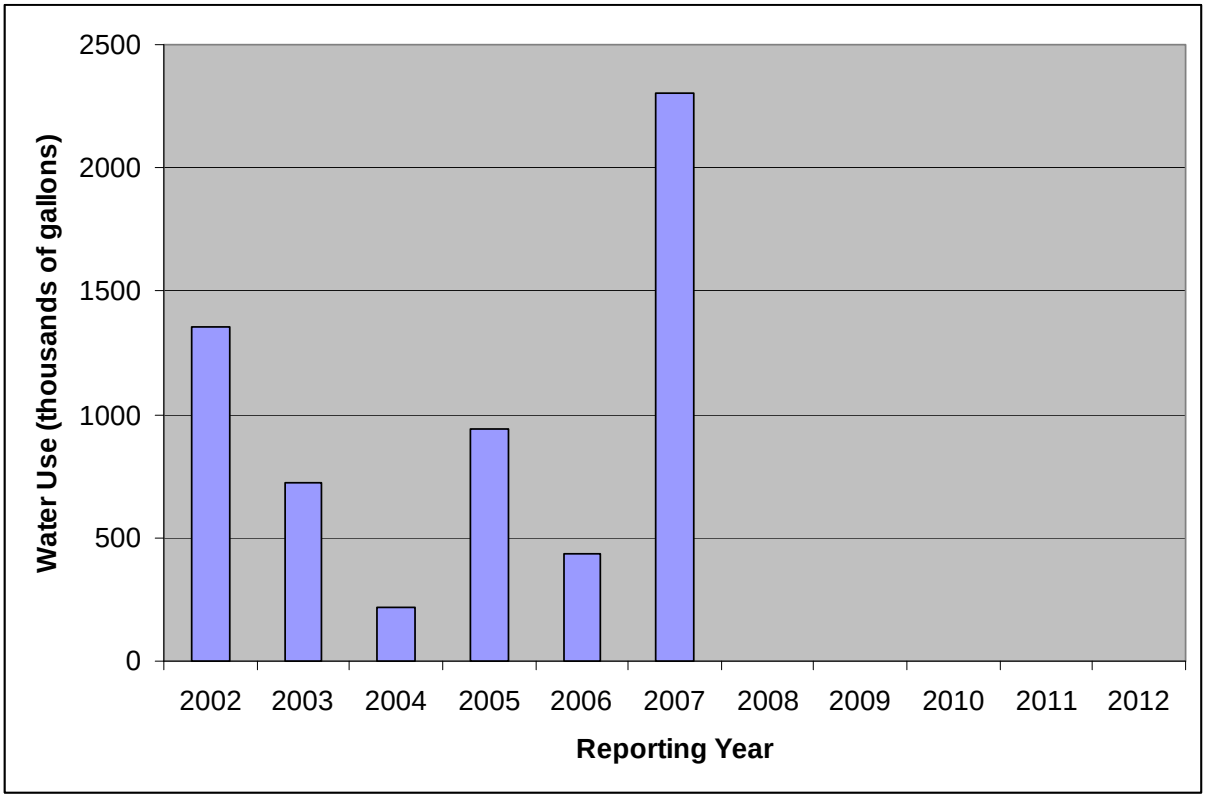

Figure 5 – SCENIC NURSERY - POND (20747-S03) - Annual Water Use (no data in 2009)

Table 4 – Scenic Nursery - Pond - Annual Water Use Statistics (2002 through 2012, no data in 2009).

	Low	High	Average
Thousands of Gallons	-	2,304	598
cfs	-	0.0098	0.0025
cfsm at Packers Falls Gage	0.00000	0.00005	0.00001

Monthly water use is highly variable and is largely related to weather conditions and plant water demands. There has been no reported water use during the months of November through February (Figure 6). Mean monthly water use increases gradually from March to a maximum in August, and then declines back to zero after October. The maximum monthly water use for the reporting period was 1.008 million gallons in both July and August 2007 (Figure 6 and Table 5). The water use during this period reflects recovery from the spring flood and does not reflect normal business operations at Scenic Nursery. Of the normal usage years, the maximum monthly water use reported was 432,000 gallons in July and August of 2005. Maximum monthly use in the last three years has been 156,000 gallons per month.

The monthly water use data were converted to flow in cubic feet per second (cfs) by dividing the monthly values by days and then multiplying this result by a flow unit conversion factor. Based on these values, average daily water use by month by Scenic Nursery has ranged from a minimum of 0 cfs (November through February in all years) to a maximum of 0.0503 cfs (32,516 gallons per day, July and August 2007), with an average of 0.0058 cfs (3772 gallons per day) for the period of 2002-08 and 2010-2012 (Table 5). Average monthly water use during the actual months of use, March through October, during these years was 172,095 gallons/month or .0089 cfs (5,661 gallons per day).

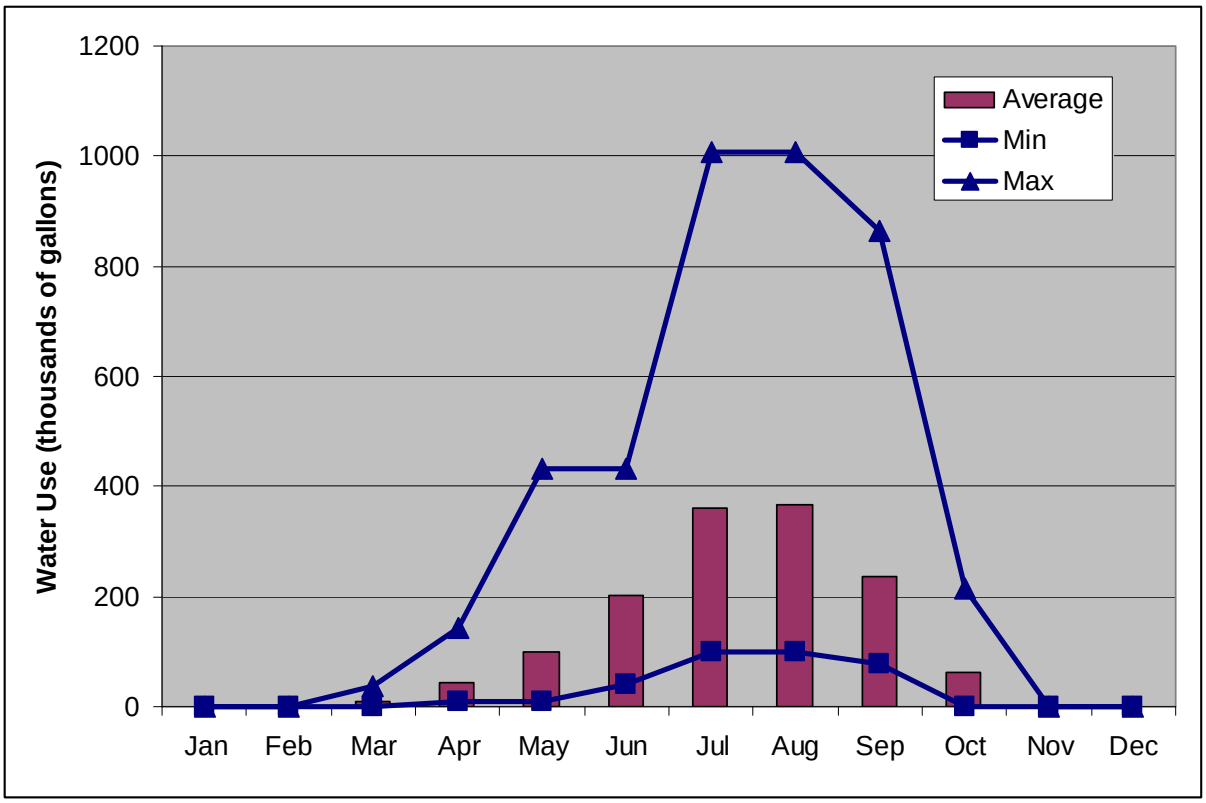

Figure 6 – SCENIC NURSERY (20747) - Monthly Water Use Statistics (2002-08 and 2010-12)

Table 5 - Scenic Nursery - Monthly Water Use Statistics (2002-08 and 2010-12)

	Low	High	Average
Thousands of Gallons	-	1,008	115
cfs	-	0.0513	0.0058
cfsm at Packers Falls Gage	0.00000	0.00028	0.00003

Figures 7 through 9 and tables 6 through 8 show monthly water use statistics by source.

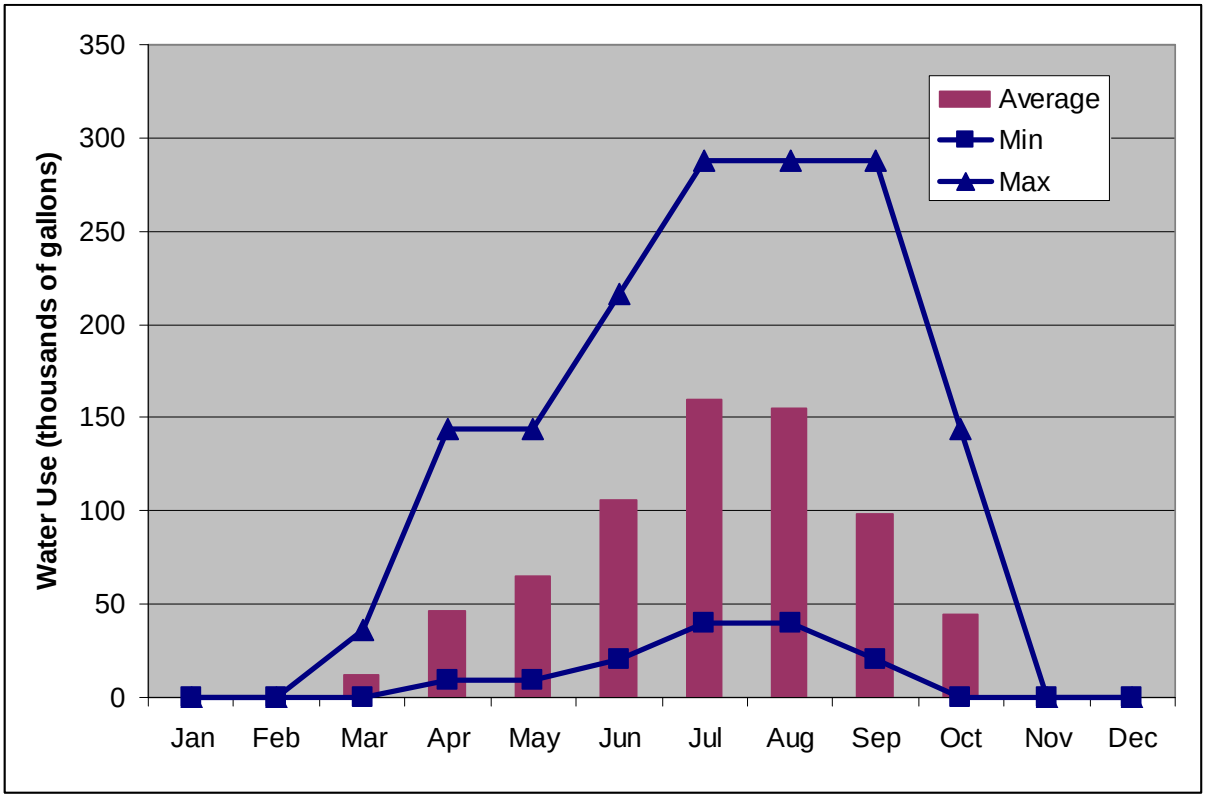

Figure 7 – SCENIC NURSERY - DUG WELL #1 (20747-S01) - Monthly Water Use Statistics (2002-08 and 2010-12)

Table 6. Scenic Nursery - Dug Well #1 - Monthly Water Use Statistics (2002-08 and 2010-12)

	Low	High	Average
Thousands of Gallons	-	288	58
cfs	-	0.0147	0.0029
cfsm at Packers Falls Gage	0.00000	0.00008	0.00002

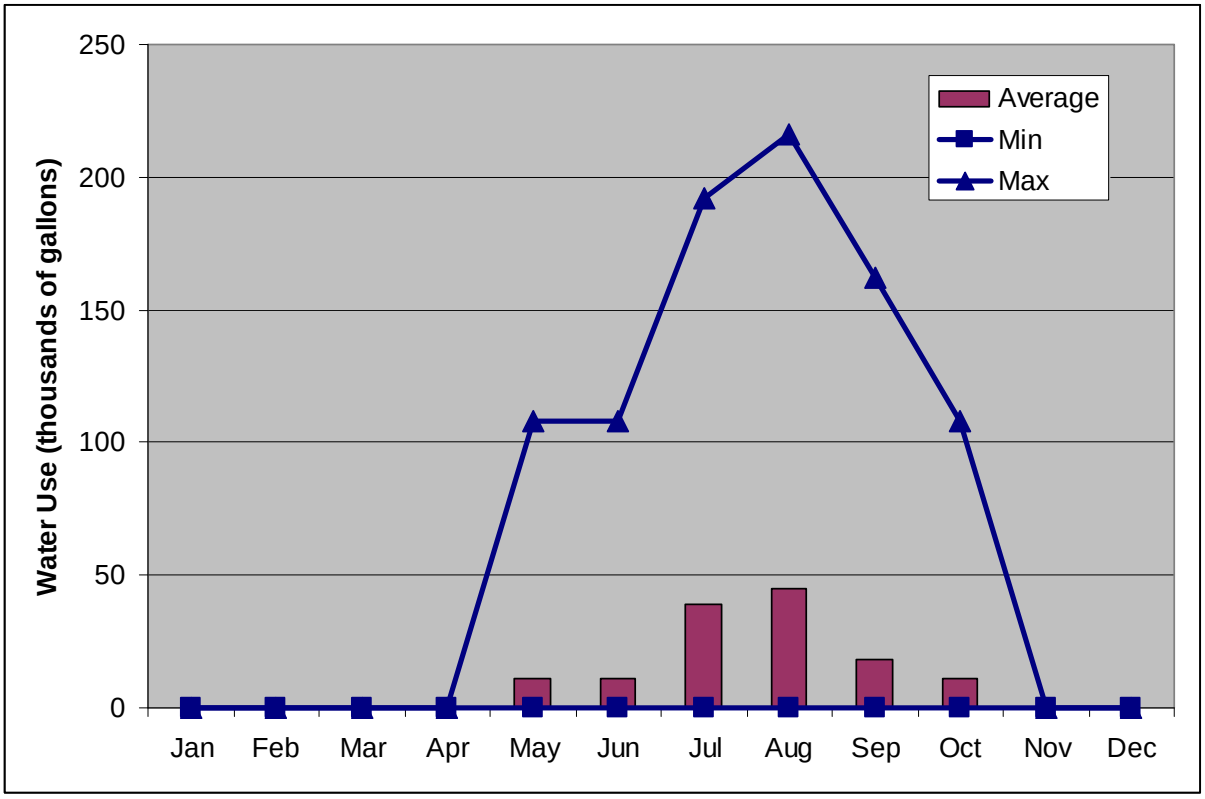

Figure 8 – SCENIC NURSERY DUG WELL #2 (20747-S02) - Monthly Water Use Statistics (2002-08 and 2010-12)

Table 7 - Scenic Nursery - Dug Well #2 - Monthly Water Use Statistics (2002-08 and 2010-12)

	Low	High	Average
Thousands of Gallons	-	216	11
cfs	-	0.0110	0.0006
cfsm at Packers Falls Gage	0.00000	0.00006	0.00000

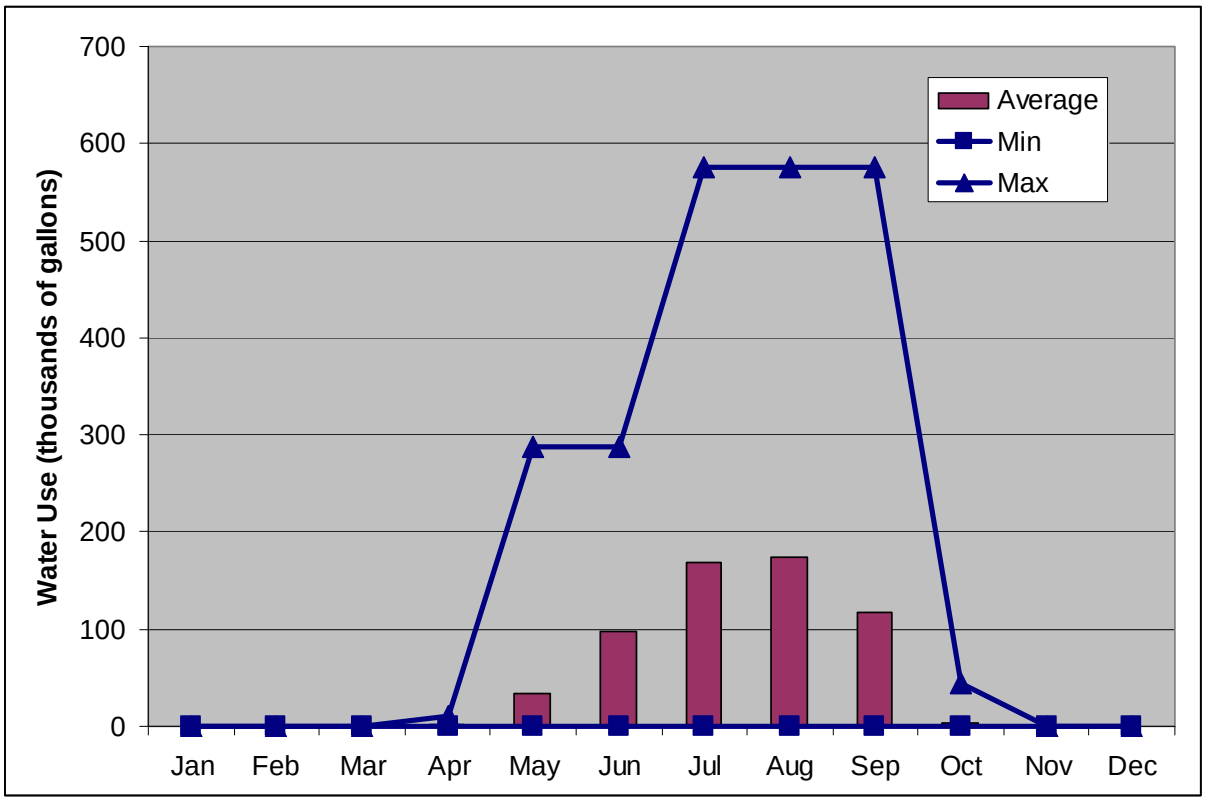

Figure 9 – SCENIC NURSERY - POND (20747-S03) - Monthly Water Use Statistics (2002-08 and 2010-12)

Table 8 - Scenic Nursery - Pond - Monthly Water Use Statistics (2002-08 and 2010-12)

	Low	High	Average
Thousands of Gallons	-	576	50
cfs	-	0.0293	0.0025
cfsm at Packers Falls Gage	0.00000	0.00016	0.00001

Env-Wq 2101 Requirements for Water Conservation Plans

Development and approval of a water conservation plan that meets the Water Conservation Rules requirements will satisfy the Conservation Plan requirements under the Instream Flow Rules. The Water Conservation Rules require different activities depending on the type of water use. All water users who irrigate crops associated with agriculture shall implement irrigation processes in accordance with the 1998 edition of the Irrigation Best Management Practices for Agriculture in New Hampshire, published by the Department of Agriculture, Markets and Food.

The Irrigation Best Management Practices for Agriculture in New Hampshire "provides a set of principles and practices to guide agricultural operators toward the most efficient use possible of the water resources of New Hampshire." The practices included in this manual are recommended for water

withdrawals for irrigation and other agricultural purposes at all times. Best Management Practices for irrigation are based on the implementation of the following management techniques in concert with knowledge of site specific variables:

- Scheduling irrigation with appropriate amounts and frequency;
- Measuring current soil water status, rainfall and irrigation water applied; and,
- Balancing rainfall and irrigation applications with crop water use.

Existing Water Conservation Measures

The Scenic Nursery currently employs several of the recommended water conservation practices for agricultural irrigation (DES, 2010 and Env-Wq 2101). The irrigation methods used by Scenic Nursery include drip irrigation of individual plants and only spray irrigating overnight during periods of dry weather, which is automatically controlled. Currently, most potted tree fields are irrigated using drip methods, while low flow overhead sprinklers are used to water the shrub container area. Some plants are also only hand watered on an as-needed basis. To further reduce water demand, the nursery also modifies the container mixes to increase the soil water holding capacity.

The irrigation system is regularly monitored for leaks to reduce water loss and the expense associated with running the pumps. The irrigation system is charged to a water pressure up to 60 pounds per square inch (PSI) before its operation. If there is a leak in the system, a drop in pressure is evident on the system pressure gauge before any water is distributed to the sprinklers or drip heads. The leak is then identified and repaired.

Water Conservation Alternatives and Costs

The accurate measurement of water use is a basic water conservation measure. USDA grants for irrigation system upgrades now usually include a meter as part of the system design. This is done to ensure compliance with calculated water budgets/ efficiency standards. Currently, Scenic Nursery estimates its water use based on pump run time for each of its three water supplies. Scenic Nursery will operate each source such that water use estimates have an accuracy of within 10 percent or will institute water use metering, testing and calibration on its existing water supplies. Scenic Nursery will work with the DES Drinking Water and Groundwater Bureau's Conservation Program to assess its water use measurement accuracy. Meters will be installed if measurement accuracy cannot be maintained within 10 percent.

If meters are installed, the cost of recording water meters is primarily dependent on the size of the water line. For water lines less than 4 inches in diameter, the cost of a new meter can range from $250 to $500. The meters will be tested and calibrated in accordance with the manufacturer's specifications. Bench testing of the meters can range up to $100 per meter and calibration, if needed, may cost an additional $100 to $200 per meter depending on the time required for calibration.

Maximum monthly water use for 2010 through 2012 was 156,000 gallons. Because of their reduced water usage, Scenic Nursery's water use since 2008 has been below the registration and reporting threshold for monthly water use (600,000 gallons per month). If Scenic Nursery demonstrates that it also uses less than 140,000, gallons per week, they would no longer be considered an Affected Water User and would be exempt from the Instream Flow Rules requirements.

Conservation Implementation Schedule

By June 1, 2014, Scenic Nursery will finalize a Water Conservation Plan in accordance with Env-Wq 2101 in order to meet the Instream Flow Rule (Env-Wq 1900) requirements for a conservation plan. The Water Conservation Plan will document Scenic Nursery's existing water conservation activities.

Water User Contact Information

Water User: Scenic Nursery & Landscaping
Address: 9 Dudley Road, Raymond, NH 03077
Contact: Glenn Caron
Phone: 895-0236

Email: glenn@scenicnursery.net

Conversion Factors for Volume and Flow Units

1	cubic foot =	7.481	gallons
1	gallon =	0.1337	cubic feet
1	acre-foot =	43,560	cubic feet
1	acre-foot =	325,872	gallons
1	cfs =	448.86	gpm
1	cfs =	646,358.4	gpd
1	cfs =	0.65	MGD
1	gpm =	0.002227866	cfs
1	gpd =	0.00000154713	cfs
1	MGD =	1.5471	cfs

Sources of Information

Env-Wq 1900 Rules for the Protection of Instream Flow on Designated Rivers.

Env-Wq 2101 Water Conservation Rules, adopted 5/12/05.

Department of Environmental Services (DES) 2010. Water Efficiency Practices for Agricultural Irrigation. Environmental Fact Sheet WD-DWGB-26-5.

New Hampshire Department of Agriculture, Markets & Food 1998. Irrigation Best Management Practices for Agriculture in New Hampshire. Dated March 1998. pg. 18.

Survey of Lamprey River Affected Water Users performed by Normandeau Associates, Inc. and completed by Glenn Caron.

Personal communication with Glenn Caron, Scenic Nursery & Landscaping.

Water use reports on file with the Department of Environmental Services (DES).

CONSERVATION PLAN

University of New Hampshire/Durham Water Supply (#20066)

Introduction

Conservation plans under the Instream Flow Program (Env-Wq 1900) require meeting the conservation measures and best management practices in the Department of Environmental Services (DES) Water Conservation Rules (Env-Wq 2101). Use of these measures and practices as a standard will provide a common level of effort by all water users.

As part of the permitting of a new water supply source, the University of New Hampshire/Durham Water System (UDWS) prepared a draft Water Conservation Plan (September 2012), which was reviewed by DES Drinking Water and Groundwater Bureau and is under revision by UDWS, but has not yet been approved.

The UDWS is a public water system supplying the Town of Durham and the University of New Hampshire campus. UDWS includes three water supply sources: the Oyster River Reservoir (owned by UNH), in the Town of Durham; the Lee Well (owned by the Town of Durham), in the Town of Lee; and a diversion (owned by UNH) from an impoundment in the Lamprey River above the Wiswall Dam in the Town of Durham. The water system is operated by UNH Water Supply personnel and receives guidance from the Water, Wastewater, and Stormwater Committee, which is staffed by representatives from both the University and the Town of Durham. The maintenance of the system is shared by UNH and the Town of Durham based on the location of the distribution lines. The water use patterns will only be described for the Lamprey River withdrawal, which is the only UDWS source in the Lamprey Water Management Planning Area. This Conservation Plan applies to the entire UDWS service area.

Water Source and Uses

The UDWS has three water sources. Two sources are outside the Lamprey River drainage basin—the Lee Wells (20066-S0x) and the Oyster River withdrawal (20066-S01). The UDWS withdrawal from the Lamprey River is registered with DES as Water User ID #20066-S02. The pumping station and intake, which were constructed in 1970, are located approximately 2,700 feet upstream of Wiswall Dam. The withdrawal is taken from the impounded river segment behind the dam. Figure 1 depicts the location of the pumping station. The withdrawal is located on the Designated River and the drainage area at the location of this diversion is approximately 183.9 square miles.

Prior to 2002, withdrawals from the Lamprey River were used to supplement the Oyster River in times of drought. Water was withdrawn from the Lamprey River on an irregular basis when demand was high and the available supply from the two other water sources was limited. In 2002 a direct connection between the Lamprey River and the Arthur Rollins Water Treatment Plant was completed. Episodes of high water usage for trials and experimentation of the new system configuration occurred from 2002

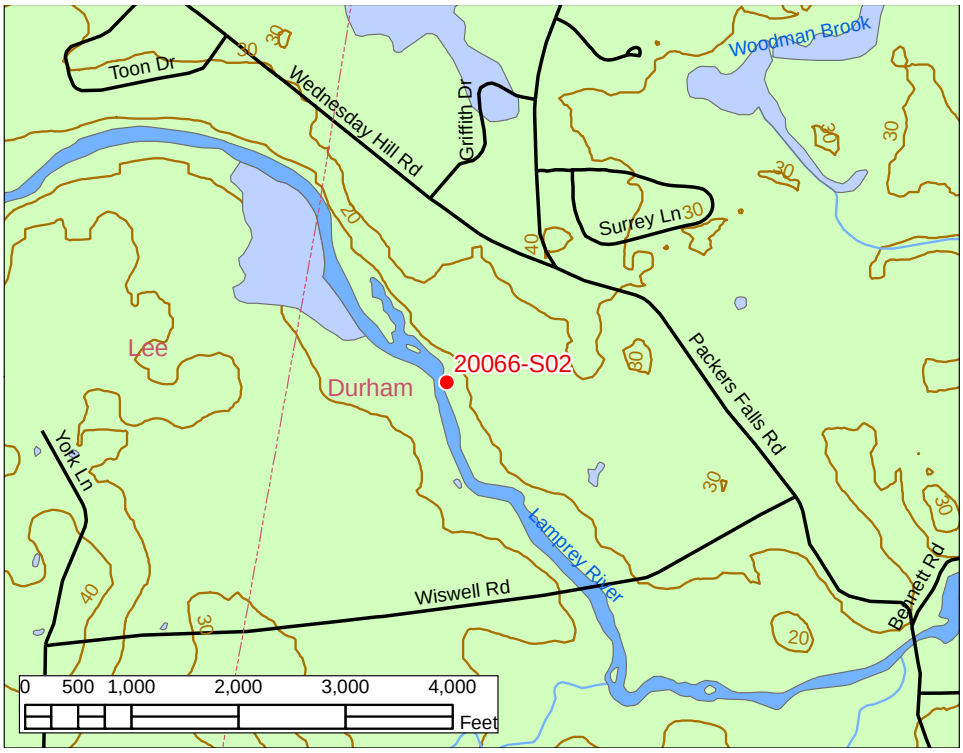

Figure 1. Location of the University of New Hampshire Water Works Lamprey River Pump Station (20066-S02).

to 2004. From 2004 through 2008 the use of the Lamprey River diversion reverted to the historical practice. In the fall of 2008, the Lamprey became the principal year round source of water for the UDWS. Prior to this, the Oyster River was the system's primary source. The water from the Lamprey and Oyster Rivers is treated at the water treatment plant and then distributed to the water system, while the Lee Well, which represents 25 percent of the total supply, supplies the system directly.

Water Use Patterns

Water use data were obtained from the DES Water Use Registration database. Annual water use data were converted from thousands of gallons to cubic feet per second (cfs) and cubic feet per square mile of drainage area (cfsm) to make comparisons with stream flow values in the Lamprey Designated River. The UDWS's water withdrawals were first registered with DES in October 1987 and water use data for the Lamprey River withdrawal are available beginning October 1988. The UDWS's withdrawals are metered and withdrawal volumes are recorded daily and totaled monthly, with the monthly and daily water use data being reported quarterly to DES.

Figure 2 and Table 1 show system-wide water use, although data gaps resulted in some years' data being presented as partial records. Dates presented are for full-year records unless identified otherwise. Water use declined 106.1 million gallons over the 1993 to 2012 period. This is a 27.2 % reduction from the 1993 water use over the 20 years of record, or an average annual decline of 1.36%.

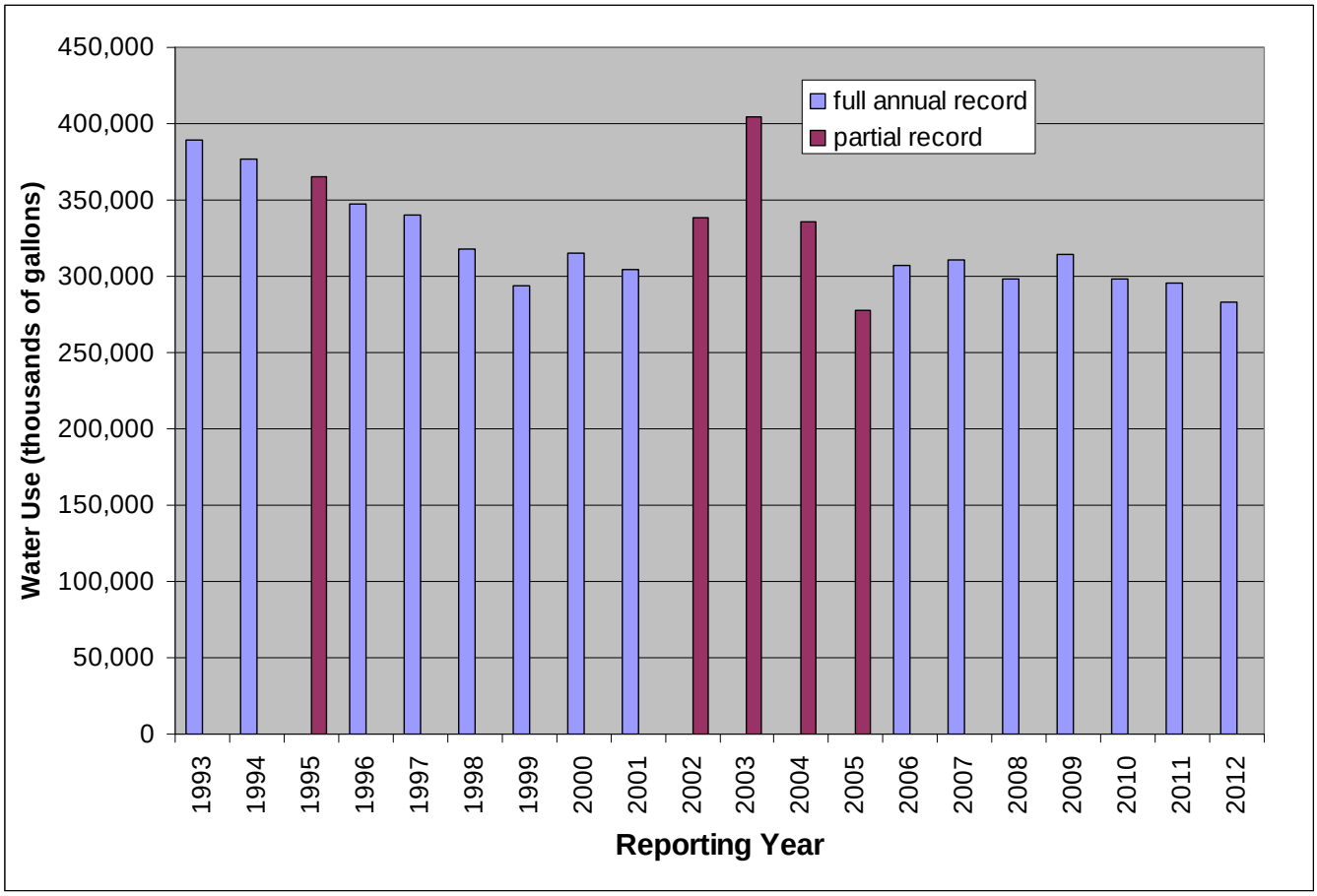

Figure 2 – UDWS (20066) – Annual Water Use

Table 1 – UDWS - Annual Water Use Statistics (from full records during 1993-2012)

	Low	High	Average
Thousands of Gallons	283,369	389,420	319,533
cfs	1.2013	1.6509	1.3546
cfsm at Packers Falls Gage	0.00656	0.00902	0.00740

In 1999, the UDWS increased its use of water from the Lee Well (20066-S03) and used less water from the Oyster River diversion (20066-S01). In late 2008, the UDWS began using the Lamprey River diversion (20066-S02) as its primary water source and use of the Oyster River diversion was further reduced. Annual withdrawals from the UDWS's Oyster River, Lamprey River and Lee well sources are summarized in the figures and tables below.

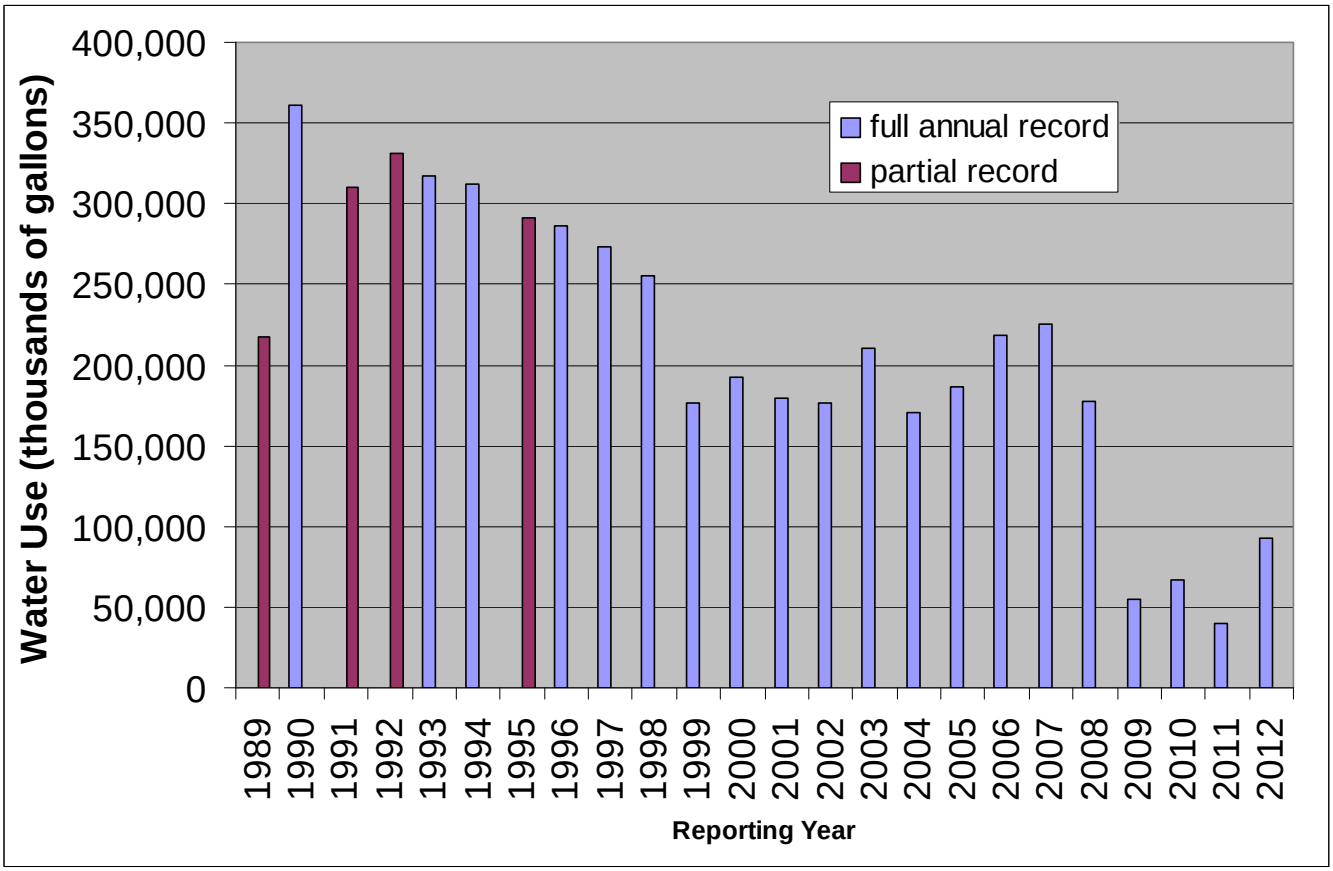

Figure 3 – UDWS – OYSTER RIVER DIVERSION (20066-S01) – Annual Water Use

Table 2 – Oyster River Diversion – Annual Water Use Statistics (from full records during 1989-2012)

	Low	High	Average
Thousands of Gallons	40,310	361,442	198,720
cfs	0.1709	1.5323	0.8424
cfsm at Packers Falls Gage	0.00093	0.00837	0.00460

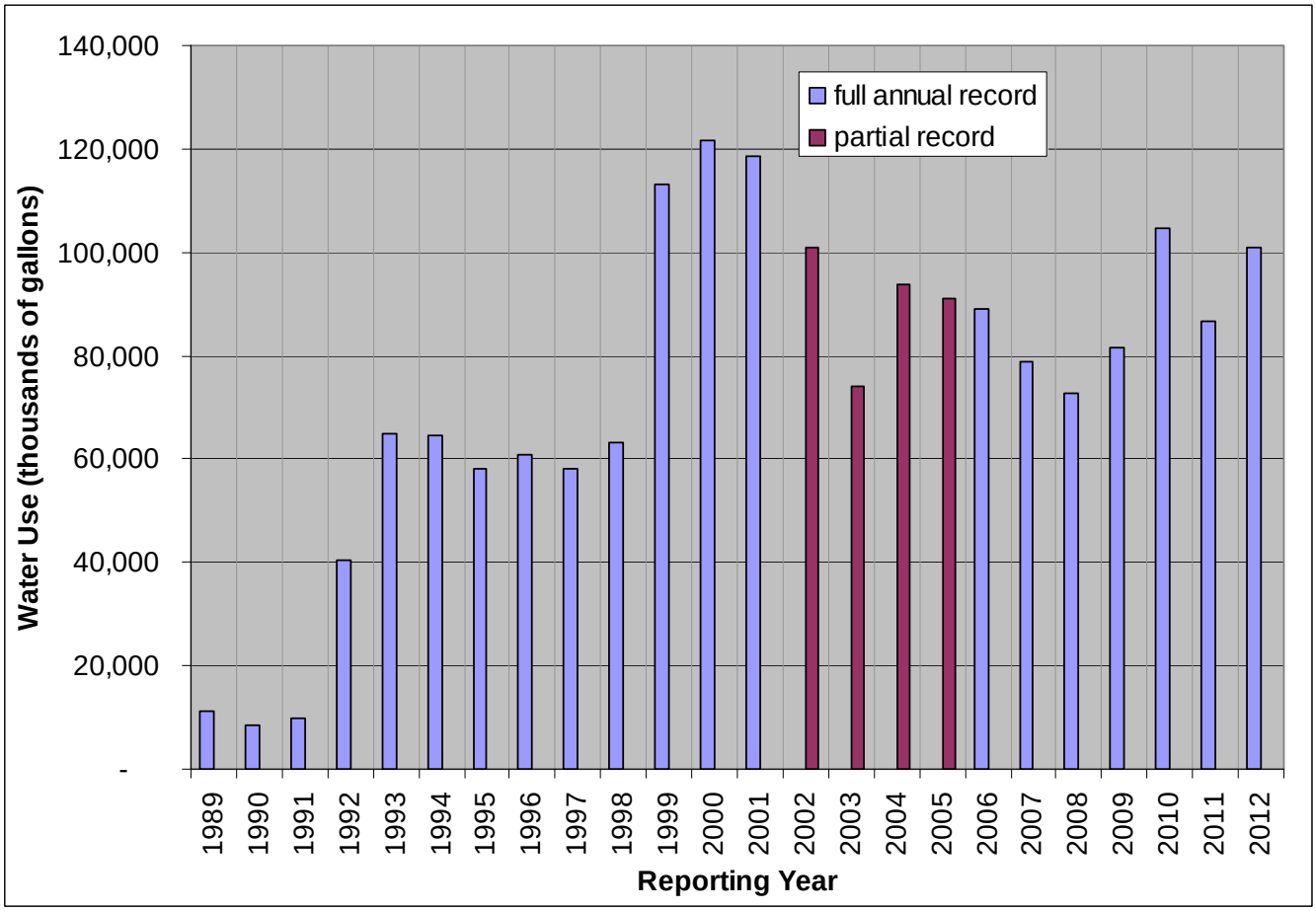

Figure 4 - UDWS – LEE WELL (20066-S03) – Annual Water Use

Table 3 – UDWS – Lee Well – Annual Water Use Statistics (1990-2012, except 2002-2005)

	Low	High	Average
Thousands of Gallons	8,409	121,668	70,392
cfs	0.0356	0.5158	0.2984
cfsm at Packers Falls Gage	0.00019	0.00282	0.00163

Prior to 2009, most supply needs were met with withdrawals from the Oyster River and the Lee Well. Withdrawals from the Lamprey River were made based on increased demand, the combined available supply from the Lee Well and Oyster River Reservoir, and sometimes due to water quality considerations. Withdrawals from the Lamprey River typically occurred during August and September, when demand increased in response to the return of UNH students to Durham, and decreased in the spring with higher stream flow available on the Oyster and the decline in the UNH student population. These withdrawals took advantage of the higher quality of the Lamprey River water to reduce the requirements for water quality treatment.

Between 1993 and 2008 water withdrawals from the Lamprey River were sporadic and irregular. Withdrawals from the Lamprey River were significantly greater from 2002 through 2004 than during all other years until 2009 (Figure 5). According to the UDWS staff, this was a result of trials and experimentation as the Lamprey River withdrawal was transitioned from a source of recharge to the Oyster River Reservoir to a direct connection with the water treatment plant. This period also coincided with several summers of below normal flows on the Lamprey and Oyster Rivers due to regional drought

conditions. Starting in late 2008, the Lamprey River became the principal source of water for the UDWS. Annual water use beginning in 2009 clearly reflects this change in priority of use. Water use statistics show the shift in emphasis placed on the use of the Lamprey River before and after the beginning of 2009.

Annual withdrawals during the period 1993 through 2008 increased by 39.8 million gallons or 515 percent. This represents an average increase of 2.487 million gallons per year or 32 percent per year over this 16 year period of record. In comparison, annual water use by the entire UDWS between 1993 and 2008 decreased by 91.4 million gallons or 23.5 percent. Annual water use from the Lamprey River from 1993 through 2008 ranged from a high of 120.905 million gallons (2003) to a low of 0 gallons (multiple years), with an average annual use of 21.963 million gallons (Table 4a). From 2009 through 2012, water use ranged from a high of 178.760 million gallons (2009) to a low of 89.630 million gallons (2012), with an average annual use of 140.948 million gallons (Table 4b).

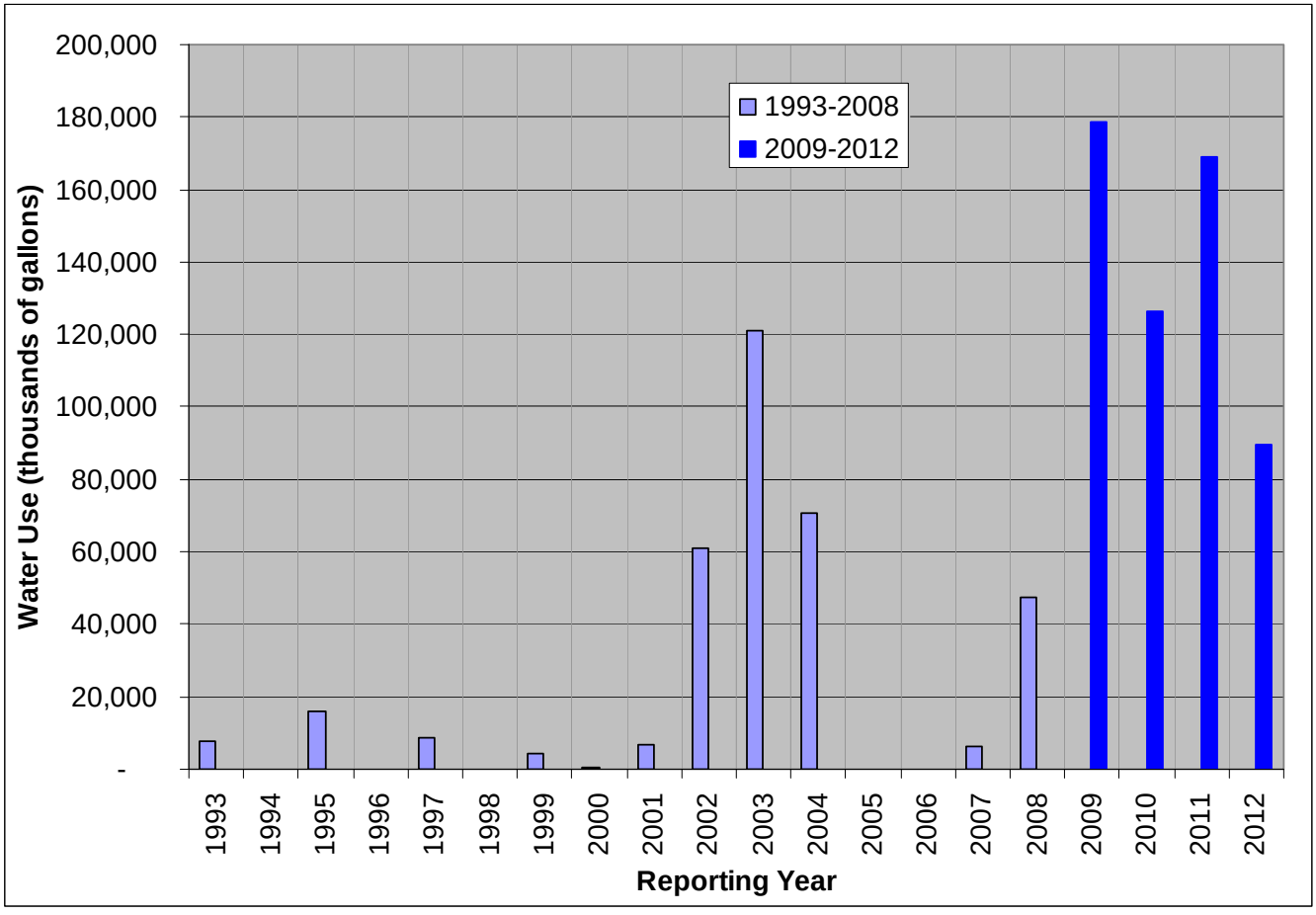

Figure 5 – UDWS - LAMPREY RIVER DIVERSION (20045-S02) - Annual Water Use (1993 through 2012).

Table 4a – UDWS – Lamprey River – Annual Water Use Statistics (1993-2008)

	Low	High	Average
Thousands of Gallons	-	120,905	21,963
cfs	-	0.5125	0.0931
cfsm at Packers Falls Gage	0.00000	0.00280	0.00051

Table 4b – UDWS – Lamprey River – Annual Water Use Statistics (2009-2012)

	Low	High	Average
Thousands of Gallons	89,631	178,760	140,948
cfs	0.3800	0.7578	0.5975
cfsm at Packers Falls Gage	0.00208	0.00414	0.00327

The UDWS's monthly water use is variable due largely to shifts in seasonal demand, particularly related to start of the university year. The monthly usage pattern is different from that of other public water supplies because the highest usage is not during the summer. The average monthly water usage is greatest during the fall and spring, and lowest during the winter and summer (Figure 6). This seasonal pattern reflects higher water usage as the university prepares for the return of students to UNH in the fall and the increased population upon their return.

The highest monthly usage for UDWS was 51.310 million gallons (October 2003). The lowest monthly usage was 13.272 million gallons (Table 5). The average monthly usage was 27.077 million gallons for 1993 through 2012.

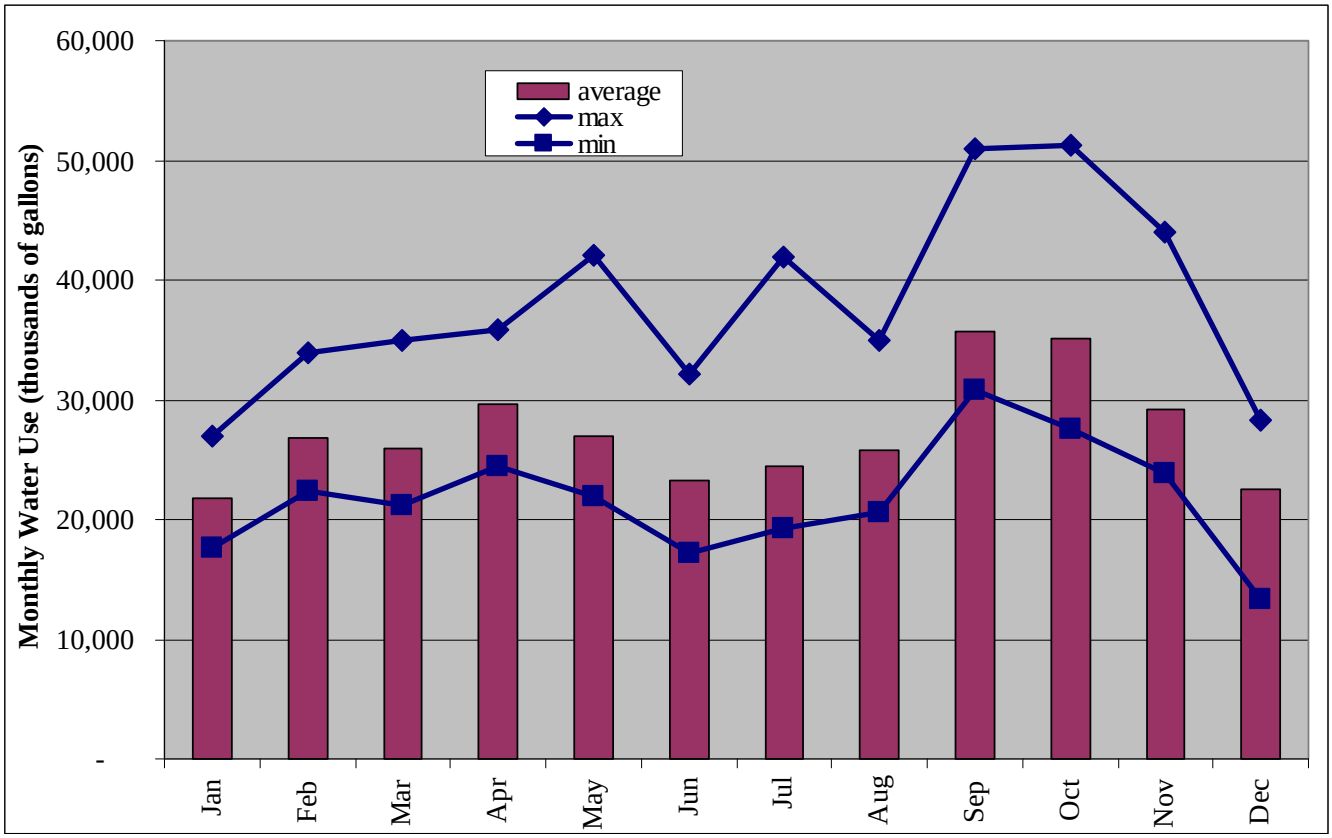

Figure 6 – UDWS – Monthly Water Use Statistics (1993-2012, except Dec 1995 and Sept 2004)

Table 5 – UDWS - Monthly Water Use Statistics (1993-2012, full record months only)

	Low	High	Average
Thousands of Gallons	13,272	51,310	27,282
cfs	0.6752	2.6102	1.3879

Monthly water use data for the Lamprey River withdrawal have been assessed separately for the period before and after the beginning of 2009. The monthly water use data in Figure 7 and Table 6 show that the average monthly water use of the Lamprey River from 1993 through 2008 ranged from a minimum of 0 cfs (multiple occurrences), to a maximum of 1.093 cfs (0.767 million gallons per day) during October 2003, with a mean monthly water use of 0.0929 cfs (65,188 gallons per day).

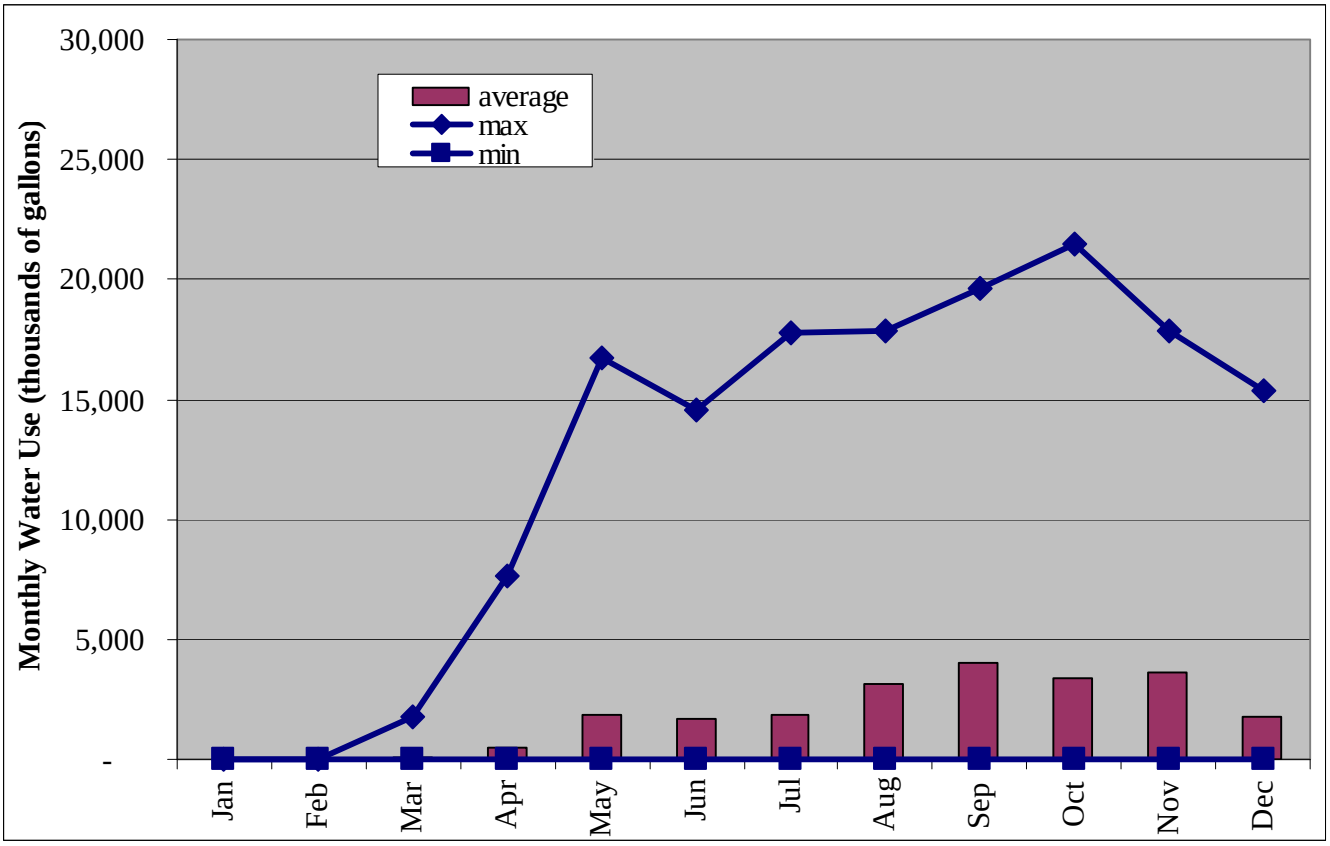

Figure 7 – UDWS – Lamprey River Diversion – Monthly Water Use (1993-2008)

Table 6 – UDWS – Lamprey River Diversion – Monthly Water Use Statistics (1993-2008)

	Low	High	Average
Thousands of Gallons	-	21,480	1,825
cfs	-	1.0927	0.0929
cfsm at Packers Falls Gage	0.00000	0.00597	0.00051

The average monthly water use of the Lamprey River beginning in 2009 through 2012, shown in Figure 8 and Table 7, ranged from a minimum of 0 cfs (multiple occurrences), to a maximum of 1.22 cfs (0.856 million gallons per day, February 2009), with a mean monthly water use of 0.596 cfs (0.385 million gallons per day) over the period 2009-2012 (Table 7).

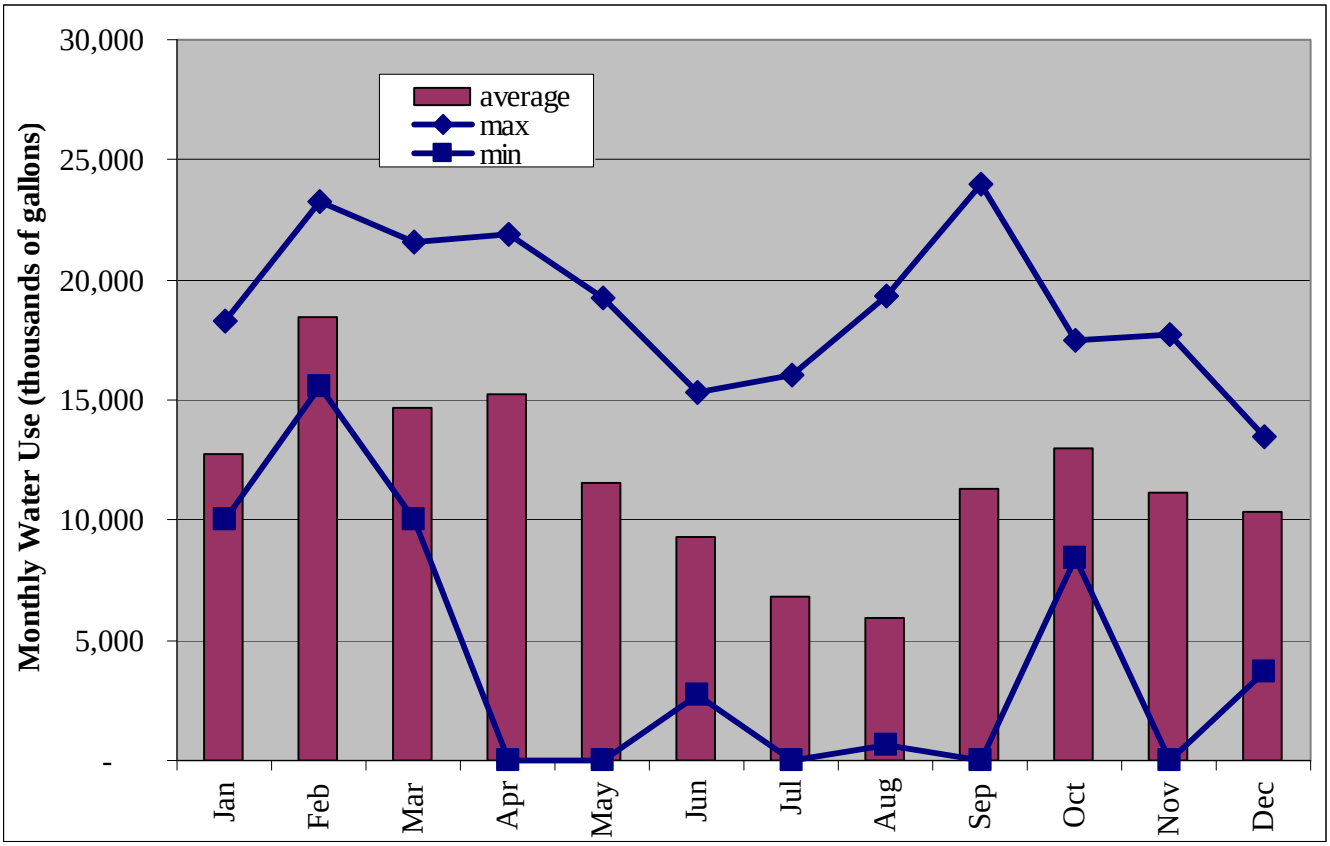

Figure 8 – UDWS – Lamprey River Diversion – Monthly Water Use (2009-2012)

Table 7 – UDWS – Lamprey River Diversion – Monthly Water Use Statistics (2009-2012)

	Low	High	Average
Thousands of Gallons	-	23,955	11,714
cfs	-	1.2186	0.5959
cfsm at Packers Falls Gage	0.00000	0.00666	0.00326

Env-Wq 2101 Requirements for Water Conservation Plan

Development and approval of a water conservation plan that meets the Water Conservation Rules requirements will satisfy the Conservation Plan requirements under the Instream Flow Rules. The Water Conservation Rules require different activities depending on the type of water use. Conservation plans for public water supplies require inclusion of the following components:

- Installation, maintenance, and use of appropriately selected meters;
- Maintaining low levels of unaccounted-for water;
- Performing water audits to assess losses;
- A comprehensive plan for leak detection surveys of the distribution system;
- System pressure reduction where necessary;
- A water conservation educational outreach initiative;
- Adopting a rate structure that promotes water conservation; and,
- On-going water conservation compliance reporting.

The UDWS will be in compliance with the water conservation plan requirements of the Instream Flow Program by completing and obtaining approval of their Water Conservation Plan through DES Groundwater and Drinking Water Bureau.

Existing Water Conservation Measures

UDWS submitted a proposed Water Conservation Plan (September 2012) to the DES Drinking Water and Groundwater Bureau in support of their permit application for the development of a new water supply source near Spruce Hole Bog in Durham. The proposed Water Conservation Plan documents the water conservation measures employed by both UNH and the Town of Durham and how its provisions would meet the water conservation requirements for existing Large Community Water Systems pursuant to Env-Wq 2101.

The 2012 draft Water Conservation Plan describes the existing and planned actions that UNH has implemented as part of its campus sustainability initiative, parts of which are described at UNH's sustainability web site (www.sustainableunh.unh.edu/biodiversity-education-initiative-bei-current-projects#water). The draft plan includes testing and calibration schedules for meters. The master meters at the water treatment facility are tested and calibrated twice a year. The meter at the Lee Well is tested annually. UNH requires all new buildings and renovations to use low flow water fixtures including urinals, toilets, showers and any dishwashers or cooling systems. UNH is also installing waterless urinals and dual flush toilets in two of its most recently renovated buildings. Students at UNH are educated on the water conservation techniques through an annual or biannual outreach effort which includes informational postings and fliers. They are instructed to report leak and drips in sinks, showers and toilets. They are also encouraged only to wash full loads of laundry, to turn the water off while brushing their teeth and to take shorter showers.

As noted in the water conservation section of UNH's Sustainability website (www.sustainableunh.unh.edu/biodiversity-education-initiative-bei-current-projectsl#water), all the water meters on campus buildings are checked via monthly readings. If a meter is 15 percent above or below a running average it is investigated. Meters 2 inches and under are calibrated on an as needed basis or replaced due to unexplained variances. Meters over 2 inches are repaired as needed and calibrated on a rotating basis. Automatic meter reading is being phased in for all meters on campus.

A comprehensive leak detection study was performed on the UDWS system in 2007. The results of the study identified 8 percent unaccounted-for losses, which is lower than the 15 percent limit in the Water Conservation Rules (Env-Wq 2101). To minimize unaccounted-for water, water use is actively monitored and reported leaks are responded to immediately.

The 2012 draft Water Conservation Plan also describes the Town of Durham's current conservation activities. The Town has metered all of its customers and reads its meters twice a year. The Town's water customers pay for their water based on a unit price and the rate structure is the same for all customer classes. The Town periodically sends out water conservation outreach materials with its bi-annual water bills and includes water conservation tips in the weekly Town newsletter that is emailed to Town residents. The Town's engineering department staff present updates to Town committees on water and water conservation issues.

Water Conservation Alternatives and Costs

As required by Env-Wq 2101 for the development of a new water supply source, the UDWS has submitted a proposed Water Conservation Plan (September 2012) to DES for the proposed Large Groundwater Withdrawal identified as Durham/UNH Production Well #2 (DGD-PW2). Completion of this plan by the UDWS and approval by the DES Drinking Water and Groundwater Bureau will meet the Instream Flow Program's Conservation Plan requirements. The Water Conservation Plan will be administered by the Drinking Water and Groundwater Bureau under their existing authority or the authority of the Instream Flow Program.

The costs for the water conservation plan are not considered part of the Instream Flow Program. Completion and approval of the existing draft Water Conservation Plan is a requirement of developing the new water supply source. As such, there are no additional costs associated the Instream Flow Program unless the UDWS abandons its plan to develop the new source.

Conservation Implementation Schedule

Prior to obtaining approval for the proposed new source, but no later than June 1, 2014, the UDWS will finalize its proposed Water Conservation Plan in accordance with Env-Wq 2101.

Water User Contact Information

Water User: University of New Hampshire/Town of Durham Water System

Address: Town of Durham Department of Public Works
100 Stone Quarry Drive, Durham, NH 03824
Contact: David Cedarholm, Town Engineer
Phone: 868-5578
Email: dcedarholm@ci.durham.nh.us

Address: UNH Energy and Utilities
17 Leavitt Lane, Durham, NH 03824
Contact: Jim Dombrosk, Director Energy and Utilities
Phone: 862-2345
Email: jim.dombrosk@unh.edu

Conversion Factors for Volume and Flow Units

1	cubic foot =	7.481	gallons
1	gallon =	0.1337	cubic feet
1	acre-foot =	43,560	cubic feet
1	acre-foot =	325,872	gallons
1	cfs =	448.86	gpm
1	cfs =	646,358.4	gpd
1	cfs =	0.65	MGD
1	gpm =	0.002227866	cfs
1	gpd =	0.00000154713	cfs
1	MGD =	1.5471	cfs

Sources of Information

Env-Wq 1900 Rules for the Protection of Instream Flow on Designated Rivers.

Env-Wq 2101 Water Conservation Rules, adopted 5/12/05.

Department of Environmental Services (DES) 2009. Final Lamprey Protected Instream Flow Report. Prepared by Normandeau Associates, Inc., Rushing Rivers Institute and the University of New Hampshire. NHDES-R-WD-08-26.

Personal communication with Wesley East. UNH/Durham Water System.

Personal communication with David Cedarholm, P.E., Town of Durham.

Survey of Lamprey River Affected Water Users performed by Normandeau Associates, Inc. completed by Wesley East. UNH/Durham Water System.

Weston & Sampson 2012. Town of Durham University of New Hampshire Water Conservation Plan (draft). Dated September 2012.

Water use reports on file with the Department of Environmental Services (DES).