COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

MITT ROMNEY
Governor

KERRY HEALEY
Lieutenant Governor

STEPHEN R. PRITCHARD
Secretary

ROBERT W. GOLLEDGE, Jr.
Commissioner

MODIFIED WATER WITHDRAWAL PERMIT
MGL c 21G

This Modified Permit is issued pursuant to the Massachusetts Water Management Act ("the Act") for the sole purpose of modifying the terms and conditions governing the withdrawal of water authorized herein. This Modified Permit conveys no right in or to any property beyond the right to withdraw the volume of water for which it is issued.

PERMIT NUMBER: 9P-3-17-071.01

RIVER BASIN: Ipswich

PERMITTEE: Town of Danvers
Town Hall, Sylvan Street
Danvers, MA 01923

Town of Middleton
195 North Main Street
Middleton, MA 01949

ORIGINAL ISSUANCE DATE: February 15, 1991

MODIFICATION DATE: March 23, 2006

EXPIRATION DATE: August 31, 2009

NUMBER OF WITHDRAWAL POINTS:

Groundwater: 4
Surface Water: 3

USE: Public Water Supply

DAYS OF OPERATION: 365

LOCATION(S):

Source	Source Code
Well #1	3071000-01G
Well #1 North Replacement Well	3071000-03G
Well #1 South Replacement Well	3071000-04G

Well #2	3071000-02G
Middleton Pond	3071000-01S
Swan Pond	3071000-02S
Emerson Brook Reservoir	3071000-03S

SPECIAL CONDITIONS

1. Maximum Authorized Annual Average Withdrawal Volume

This Modified Permit authorizes the withdrawal of water for the purpose of serving the residences, schools, businesses, municipal facilities, and institutions in the Towns of Danvers and Middleton, at the rate described below on average over a calendar year. The volume reflected by this rate is in addition to the 3.14 million gallons per day (MGD) previously registered to the permittee through the Water Management Act Program. The Department of Environmental Protection (the Department) will use raw water volumes to assess compliance with the volumes authorized by Danvers' registration and this Modified Permit.

The permitted volume is expressed in millions of gallons, both as an average daily withdrawal rate per year, and as a total annual withdrawal volume for each period of the term of this Modified Permit.

Withdrawals are authorized as follows:

				Daily Average (MGD)	Total Annual (MGY)
Period One Years 2-5	2/15/1991	to	8/31/1994	0.56	204.40
Period Two Years 6-10	9/1/1994	to	8/31/1999	0.56*	204.40
Period Three Years 11-14	9/1/1999	to	5/18/2003	0.69	251.85
Period Four Years 15-20	5/19/2003	to	8/31/2009	0.58*	211.70

* Because actual withdrawal volumes have been significantly below allocated amounts and there is insufficient water available in the Ipswich River Basin to support increased withdrawals, the Department held Danvers' permitted withdrawal volumes to the volume originally allocated for Period One. The permitted volume has been increased slightly in Period Four to address the change from finished water to raw water as the means of assessing compliance.

If, for any year beginning with calendar year 2006, overall water withdrawals by the Towns of Danvers and Middleton exceeds 3.72 MGD on an average annual daily basis, then on or before March 1st of the following year, Danvers and Middleton shall submit to the Department for its review and approval a plan and schedule for implementing a water bank. Thereafter, the Towns shall implement the plan and schedule as approved by the Department.

At a minimum, a water bank implemented by either Town shall provide for conserving or keeping within the basin at least two gallons of water within the basin for every gallon of water demand added to the system. The water bank requirement applies even if either Town exceeds the volume stated herein on an average annual daily basis by an amount that is less than the threshold volume. Any plan and schedule for implementing a water bank prepared by either Town shall include a plan and schedule to evaluate options, such as purchase and/or development of out-of-basin sources or enhanced water conservation, that would enable the Town to return to compliance with the volumes stated herein.

2. Maximum Authorized Daily Withdrawal Volume

Withdrawals from individual withdrawal points are not to exceed the approved maximum daily volume listed below without specific advance written approval from the Department.

Source	Source Code	Daily Maximum (MGD)
Well #1	3071000-01G	0.86 combined
Well #1 North Replacement Well	3071000-03G	
Well #1 South Replacement Well	3071000-04G	
Well #2	3071000-02G	0.98
Middleton Pond	3071000-01S	6.50
Swan Pond	3071000-02S	not applicable
Emerson Brook Reservoir	3071000-03S	not applicable

3. Surface Water Protection

By December 31, 2007**:**

1) The Danvers Water Department shall comply with 310 CMR 22.20C(1)(d)4 to develop a DEP-approved surface water supply protection plan;

2) The Town of Middleton shall implement zoning and non-zoning controls that meet the requirements of 310 CMR 22.20C(2) to protect the portion of the Zone A that lies within Middleton; and

3) The Danvers Water Department shall demonstrate that it has used its best efforts to get the Towns of North Reading and North Andover to implement zoning and non-zoning controls that meet the requirements of 310 CMR 22.20C(2) to protect the portions of the Zone A that lie within those Towns. For additional information or for assistance with developing a local protection plan or land use controls, the Danvers Water Department should contact the Department's Drinking Water Program.

4. Zone of Contribution (Zone II or Zone III) Delineations

Department records show that Well #1 (3071000-01G) and Well #2 (3071000-02G), including the Well #1 replacement wells, have a DEP approved Zone II delineation. Therefore, no further Zone II work is required as a condition of this Modified Permit.

5. Wellhead Protection

Department records show that the Danvers Water Department meets the requirements of 310 CMR 22.21(2) for Well #1 (3071000-01G) and Well #2 (3071000-02G), including the Well #1 replacement wells. Therefore, no additional wellhead protection work is required as a condition of this Modified Permit.

6. Firm Yield of Surface Water Supplies

The Department hereby accepts the Firm Yield of **3.51 MGD** for Middleton Pond, Swan Pond, and Emerson Brook Reservoir, based on the one (1) in 20-year drought, as determined by SEA Consultants, Inc., using the Department-developed Firm Yield Estimator Version 1.0 software.

Withdrawals from Middleton Pond, Swan Pond, and Emerson Brook Reservoir, as measured at the raw water influent to the Middleton Pond Water Treatment Plant, shall not exceed 3.51 MGD as an annual average.

7. Streamflow Maintenance

Operation of Wells Nos. 1 (including its replacement wells) and 2 shall be restricted in accordance with the Groundwater Withdrawals Operations Chart in Appendix A. This chart has been modified from Tables 8 and 9 in Danvers' March 2002 "Water Supply Operations Plan" to reflect new streamflow thresholds for the Ipswich River Basin. These thresholds are expressed in cubic feet per second (cfs) at the U.S. Geological Survey (USGS) gauge in South Middleton. The chart indicates when the wells must be shut off, pumped only every other day, or may be used at their full approval rates. The Water Supply Operations Plan shall be modified 1) in accordance with this chart; and 2) to include a clause regarding maintenance, such that multiple sources shall not simultaneously be rendered inoperable for maintenance purposes. Danvers' response to the 2001-02 drought was hindered by Wells Nos. 1 and 2 both being shut down for major upgrade projects.

A permanent staff gauge shall be maintained along the Ipswich River by Well No. 1. Weekly water level measurements shall be collected. Records of the weekly staff gauge measurements shall be kept and submitted to the Department upon request.

8. Streamflow Triggers and Outside Water Use Restrictions

Beginning on May 1, 2006, both Danvers and Middleton shall implement the Required Actions identified in the Water Conservation Plan attached at Appendix B. The streamflow thresholds set forth in Appendix B are the mean daily streamflows recorded at the applicable USGS gauge.

Should the reliability of flow measurements at the South Middleton gauging station be so impaired as to question its accuracy, then the Modified Permit holder may request for the Department's review and approval, that the trigger mechanism be transferred to the USGS Ipswich River at Ipswich gauge, #01102000. The implementation of restrictions will be triggered by the same cubic feet per second per square mile ("cfsm") values, which translate to a flow of 70.0 cubic feet per second ("cfs") for voluntary restrictions, and 52.5 cfs for mandatory restrictions. Should the Department become aware of concerns about the reliability of either gauge, it may upon immediate notification to the Modified Permit holder transfer the measurement point to an alternate gauge. The Department reserves the right to require use of a different gauge.

Required Actions, whether voluntary or mandatory restrictions, require effective notification of the public as soon as practicable of drought stage and restrictions. Documentation and/or evidence of notification shall be forwarded to the Department within ten (10) business days of publication. Notice shall at a minimum include:

1. the streamflow value triggering the required notification;
2. the need to limit water use, especially nonessential outside water use, to protect streamflow for aquatic life and to ensure a sustainable drinking water supply;
3. ways individual homeowners can limit water use, especially nonessential outside water use;
4. in the case of mandatory restrictions, a detailed description of the restrictions and the penalties for violating the restrictions.

The Towns shall allow outside watering only as specified in Appendix B. Notwithstanding the foregoing, irrigation of public parks and recreational fields by means of automatic sprinklers equipped with moisture sensors or similar control technology may also be permitted from May 1 until September 30 no more than two days a week outside the hours 8AM – 7 PM. For the purpose of this Modified Permit, the term "nonessential outside water use" is defined to include those uses that do not have health or safety impacts, are not required by regulation, and are not needed to meet the core functions of a business or other organization. Each Town shall have the authority to enforce mandatory restrictions within its borders, including the authority to assess penalties or impose fines for violations.

In order to evaluate the effectiveness of the restrictions on nonessential outside water use, the Department requires that each Town submit, along with its Annual Statistical Reports, a report documenting all actions taken by the Town to implement and enforce the restrictions on nonessential outside water use, including without limitation the dates the restrictions on nonessential outside water use were in place, the streamflow threshold that triggered the restrictions, the restrictions imposed, and the Town's efforts to enforce the restrictions, including the names and addresses of those against whom action was taken and any fines or penalties imposed.

Commencing on May 1, 2006, the Towns of Danvers and Middleton shall each enforce outside water use bylaws, ordinances, regulations, and/or alternative authority that will enable each Town to legally enforce limitations on nonessential outside water use when necessary. The May 2002 *Guide to Lawn and Landscape Water Conservation* by the Massachusetts Water Resources Commission, which includes the latest version of the Department's Model Water Use Restriction Bylaw, is available on the Internet at *http://www.state.ma.us/envir/mwrc/pdf/LawnGuide.pdf*.

9. Ipswich River Basin Performance Standards

Beginning with calendar year 2006, the Towns of Danvers and Middleton shall each meet the following performance standards:

Performance Standard for Unaccounted for Water

Unaccounted for water shall not exceed 10% of overall water use.

Danvers' Annual Statistical Report shall provide a detailed assessment of its unaccounted for water. (The design of the water system does not allow this amount to be determined individually for the two Towns.) Unaccounted for water is defined by the Massachusetts Water Resources Commission as the difference between water pumped or purchased and water that is metered or confidently estimated. Unaccounted for water shall include water that cannot be accounted for due to meter problems, unauthorized hydrant openings, unavoidable leakage, recoverable leakage, illegal connections, standpipe overflows, and fire protection.

Water used for fire protection and fire training may be excluded from Unaccounted-for-Water in the Annual Statistical Report if the Town utilizes a methodology for "confidently estimating" such uses, which is approved by the Department . The Department has approved, as a reasonable estimation methodology, the documented increase in system-wide demand during a large fire event. This volume may be derived by subtracting from daily water use during the period of a fire, the average of daily use for a number of days prior to, and several days following, a fire suppression event. Fire suppression and fire protection uses shall be accounted for separately in the Annual Statistical Report and shall be listed separately from other volumes calculated and reported as Unaccounted-for-Water in that Report. The Towns' methodology used for this estimation must be attached to the Report in addition to the estimated volumes used. A calculus of hose volume and/or pumping capacity over time is one method for estimating fire training use as well as the comparisons of system wide average daily use described above.

The need for water main flushing and the use of water in construction or meter calibration shall be metered or estimated as appropriate to assist in determining actual demand. Volumes flushed to waste shall be reported annually on Danvers' Annual Statistical Report; Middleton shall provide its determination of the volume flushed to waste in Middleton to Danvers, for inclusion on the Annual Statistical Report.

Performance Standard for Residential Per Capita Water Use

Residential Per Capita Water Use shall not exceed 65 gallons per day.

Danvers and Middleton shall each report their residential gallons per capita per day ("RGPCD") and the calculation used to derive that figure as part of their Annual Statistical Reports. The RGPCD is the total volume of residential water use in gallons divided by the population served. The Town's shall provide the source of the data used to establish the service population, and the year in which this data was developed, shall be provided. If either Town fails to meet the performance standard for keeping its RGPCD of water use at or below 65 gallons per day, the Department may require that Town to implement restrictions on nonessential outside water use that are more stringent than the restrictions set forth in Special Condition #8.

Performance Standard for Seasonal Water Use

Water use between May 1st and September 30th shall not exceed the seasonal cap of 587.52 million gallons for Danvers and Middleton, combined. To stay within this cap, water use from May 1st through September 30th shall be kept at or below an average daily volume of 3.84 MGD for Danvers and Middleton. If the Towns exceed this seasonal cap, the Department may require the Towns to implement more stringent restrictions on nonessential outside water use than those set forth in Special Condition #8.

Performance Standard for Restricting the Use of Unregulated Irrigation Wells

The Department has been informed that within the Ipswich River Basin there has been an increase in the number of wells that are not subject to regulation under the Water Management Act and are used in whole or in part for irrigation purposes (hereinafter "unregulated irrigation wells"). To avoid a further increase in the number of such wells, the Department determined that because of the stressed nature of the Ipswich River, it is appropriate that the communities located in the Ipswich River Basin make the use of unregulated irrigation wells subject to the restrictions on nonessential outside water use that are triggered by streamflow thresholds, that are required by this Modified Permit and that apply to customers of the public water system.

Most of the Town of Danvers is outside the Ipswich River Basin, so regulation of unregulated irrigation wells in Danvers would not result in water being kept in the Ipswich River Basin. The Department requires that Middleton submit, along with its Annual Statistical Report, a report documenting all actions taken by Middleton to enforce its bylaw, numbered Chapter V, entitled, "Water Conservation," as enacted May 10, 2005, and any fines or penalties imposed. Beginning in 2006, Middleton shall enforce its bylaw cited above in conjunction with implementing the restrictions as required by Special Condition 8, above, and outlined in Appendix B.

10. Enhanced Water Conservation and Water Use Mitigation Plan

Each Town shall immediately implement the Water Use Mitigation Plan, attached hereto at Appendix C. Each Town shall provide an annual Enhanced Credit/Demand Accounting ("Accounting") that specifies what the Town has undertaken in the past year to enhance its water conservation and mitigation efforts, including but not limited to a list of and details of projects pursuant to Section 2 b though f, inclusive, of the Water Use Mitigation Plan, as well as any other relevant projects completed during that year. The Accounting shall be submitted in writing to the Department concurrent with the submission of the Annual Statistical Report.

If, in any year beginning with calendar year 2006, Danvers and/or Middleton fails to comply with the Performance Standards for RGPCD and/or Seasonal Water Use, the Town(s) shall develop and implement an enhanced water conservation plan for the following calendar year. For any year in which the Town(s) is(are) required to develop and implement an enhanced water conservation plan, the Town(s) shall submit, along with their respective Annual Statistical

Report, a report documenting all actions taken by the Town(s) to develop and implement the enhanced water conservation plan.

The enhanced water conservation and water use plan shall include, at minimum, the Water Use Mitigation Plan, attached hereto at Appendix C, and may include, but is not limited to, the items listed below:

- Adoption and enforcement of a bylaw or other regulation to require moisture sensors or similar control technology on automatic sprinklers
- Adoption and enforcement of a bylaw or other regulation to limit the amount of land clearing for the creation of lawns
- Adoption and enforcement of a bylaw or other regulation to promote infiltration of stormwater to recharge groundwater at a rate 1.5 times the volume of recharge for new development projects and a rate of 1.0 times the volume of recharge for redevelopment projects for the appropriate hydrologic group, as identified in Standard 3 of the DEP Stormwater Management Standards
- Irrigation of recreational fields and parks in accordance with the Water Resources Commission's May 2002 *Guide to Lawn and Landscape Water Conservation*
- Encouragement of the use of cisterns or rain barrels for outside watering thru the use of a rebate or at-cost program
- Encourage environmentally friendly landscaping as suggested in Appendix D, Environmentally Friendly Landscaping List
- Enhanced public education outreach
- Purchase and/or development of out-of-basin sources

At a minimum, the enhanced water conservation plan shall meet the requirements set forth below.

- If Danvers or Middleton fails to comply with the performance standard for keeping residential per capita water use at or below 65 gallons per day, the enhanced water conservation plan shall include the implementation of a program to make water saving devices such as faucet aerators, low flow shower heads, and toilet displacement bottles/dams available to its customers at cost and to provide rebates or other incentives for the purchase of low flow appliances (washing machines, dishwashers, and toilets) and the installation of moisture sensors or similar control technology on irrigation systems.

- Any enhanced water conservation plan required by this Modified Permit shall include (1) submission of a report that evaluates the effectiveness of an increasing block rate or a seasonal rate as a tool for encouraging water conservation; (2) implementation of any changes to the current rate structure that will encourage water conservation; and (3) notification to the Department of the changes along with the reason for these changes. Any enhanced water conservation plan for Danvers shall also evaluate Danvers' practice of allowing second meters for irrigation and recommend whether this practice should be changed or discontinued.

11. <u>Control of Unaccounted for Water</u>

At a minimum, Danvers shall take the actions listed below to meet the performance standard for keeping unaccounted for water at or below 10%.

Metering

- Continue the ongoing program to inspect individual service meters to ensure that all service meters accurately measure the volume of water used by your customers to within 2%. Such plan shall continue to include provision for, and scheduling of, placing sufficient funds in the annual water department budget to recalibrate, repair, or replace meters as necessary.

- Continue to calibrate all master meters on an annual basis.

Leak Detection

- Continue to conduct a full leak detection survey at least every three years. In addition, a leak detection survey of the entire distribution system shall be performed whenever unaccounted for water exceeds 10% of overall water use, or the percentage of unaccounted for water increases by 5% or more (for example, an increase from 2% to 8%) over the percentage reported on Danvers' Annual Statistical Report for the prior calendar year. On or before December 31 of any calendar year in which a leak detection survey takes place, Danvers shall submit to the Department for its review a report detailing the leak detection survey, any leaks uncovered as a result of the survey or otherwise, and the estimated water savings as a result of the repair.

Leak Repair

- Leak repair reports shall be available for inspection by the Department.

- Leaks are to be fixed as soon as possible, including leaks in any water pipes up to the service meter. In no event shall any leak remain unrepaired more than seven (7) days after detection.

12. Reporting Requirements

The Annual Statistical Report ("ASR") shall be filed by Danvers and by Middleton each year. Danvers' ASR shall include information on the amount of water supplied to the Middleton water distribution system in accordance with 310 CMR 22.15(5)(a)2. Daily pumping records from the wells and daily streamflow records shall be kept and submitted to the Department as attachments to the Annual Statistical Reports.

Danvers shall also report both the raw and finished water volumes for the entire water system. For individual water sources in the water system, raw water volumes shall be reported.

13. Large Water User Conservation Program

Danvers and Middleton shall implement a program to reduce water use by the ten (10) largest customers in Danvers and at least the five (5) largest customers in Middleton. The program shall

require a water audit or some comparable review of water use, if not already performed, and a timetable for achieving water use reduction goals identified by the audit. On or before the two (2) year anniversary of the issuance of the final permit, Danvers and Middleton shall report on the effectiveness of this program. Upon receipt of the program description and the report on its effectiveness, the Department will take whatever action it deems appropriate to promote the interests of the Water Management Act, including without limitation modification of the permit to require additional actions to reduce commercial and industrial water use.

14. General Conservation Requirements

Pricing

- Continue to ensure that water supply system operations are fully funded by water supply system revenues. The pricing system should reflect the full cost of supplying water, including but not limited to:

    - administrative costs
    - staff salaries, benefits, insurance and pension costs
    - distribution system operation, maintenance and repair, including leak detection and repair costs and metering costs
    - pumping costs and utilities
    - treatment costs
    - capital replacement costs, capital depreciation and debt service
    - costs incurred for water conservation programs and public education programs
    - watershed or wellhead purchase and/or protection costs and land acquisition
    - emergency planning

Plumbing

- Each Town shall enforce the March 1, 1989 plumbing code for new construction and building rehabilitation requiring installation of water saving devices and low flow toilets.

- By June 30, 2006, Danvers and Middleton shall each submit to the Department a status report detailing which public buildings have been retrofitted with water saving devices (faucet aerators, low flow shower heads and toilet displacement bottles/dams) and which buildings have yet to be retrofitted, along with a schedule to complete the retrofitting by May 31, 2007. On or before September 30, 2007, Danvers and Middleton shall each complete the retrofit of all public buildings except for the Danvers High School, the Howe Manning Elementary School in Middleton, and the Flint Public Library in Middleton projects, and notify the Department in writing that the retrofit is complete. The retrofitting of the three (3) listed projects that are exempt from the September 30, 2007 deadline shall be completed by the end of those construction projects. Each Town shall submit an annual report on the status of that/those project(s) to the Department when they submit the Annual Statistical Report.

Education

- Danvers and Middleton shall each continue its ongoing education program which includes: public service announcements, school materials, speakers for community groups, conservation information center, and public space advertising (including Town Hall exhibits). This public education program shall emphasize:

    - all the costs of providing water
    - that investments in efficiency and conservation will provide consumers with long-term savings
    - how water use fluctuates seasonally throughout the year
    - the environmental benefits of reducing water demand

- Bill stuffers with water conservation tips or water saving messages should be included at least annually with customer's water bills, or as a separate mailing. Copies of this information shall be available to the Department upon request.

GENERAL CONDITIONS

1. **Duty to Comply** The permittee shall comply at all times with the terms and conditions of this Modified Permit, the Act and all applicable State and Federal statutes and regulations.

2. **Operation and Maintenance** The permittee shall at all times properly operate and maintain all facilities and equipment installed or used to withdraw up to the authorized volume so as not to impair the purposes and interests of the Act.

3. **Entry and Inspections** The permittee or the permittee's agent shall allow personnel or authorized agents or employees of the Department to enter and examine any property for the purpose of determining compliance with this Modified Permit, the Act or the regulations published pursuant thereto, upon presentation of proper identification and an oral statement of purpose.

4. **Water Emergency** Withdrawal volumes authorized by this Modified Permit are subject to restriction in any water emergency declared by the Department pursuant to MGL c 21G, ss. 15-17, MGL c 150, ss. 111, or any other enabling authority.

5. **Transfer of Permits** This Modified Permit shall not be transferred in whole or in part unless and until the Department approves such transfer in writing, pursuant to a transfer application on forms provided by the Department requesting such approval and received by the Department at least thirty (30) days before the effective date of the proposed transfer. No transfer application shall be deemed filed unless it is accompanied by the applicable transfer fee established by 310 CMR 36.37.

6. **Duty to Report** The permittee shall submit annually, on a form provided by the Department (the Annual Statistical Report), a certified statement of the withdrawal, such report to be received by the Department by February 28th of each year. Such report must be mailed or hand delivered to:

Department of Environmental Protection
Water Management Program

One Winter Street, 6th Floor
Boston, MA 02108

7. **Duty to Maintain Records** The permittee shall be responsible for maintaining monthly withdrawal records.

8. **Metering** All withdrawal points included within the Modified Permit shall be metered. Said meters shall be calibrated annually.

NO WITHDRAWAL AUTHORIZED HEREIN SHALL EXCEED THE SAFE YIELD OF THE BASIN AS DETERMINED BY THE DEPARTMENT.

NO WITHDRAWAL IN EXCESS OF 100,000 GALLONS PER DAY OVER THE REGISTERED VOLUME (if any) SHALL BE MADE FOLLOWING THE EXPIRATION OF THIS PERMIT, UNLESS BEFORE THAT DATE THE DEPARTMENT HAS RECEIVED A RENEWAL PERMIT APPLICATION PURSUANT TO 310 CMR 36.00.

Appendix A

GROUNDWATER WITHDRAWALS OPERATIONS CHART

Well No. 1 — 0.86 MGD (600 gpm)
Well No. 2 — 0.98 MGD (680 gpm)

Month	Shut Off	Alternate Day Pumping	Daily Pumping
January	< 18.7 cfs	18.7 – 44.5 cfs	> 44.5 cfs
February	< 18.7 cfs	18.7 – 44.5 cfs	> 44.5 cfs
March	< 18.7 cfs	18.7 – 44.5 cfs	> 44.5 cfs
April	< 18.7 cfs	18.7 – 44.5 cfs	> 44.5 cfs
May	< 18.7 cfs	18.7 – 44.5 cfs	> 44.5 cfs
June	< 18.7 cfs	18.7 – 29.8 cfs	> 29.8 cfs
July	< 18.7 cfs	18.7 – 29.8 cfs	> 29.8 cfs
August	< 18.7 cfs	18.7 – 29.8 cfs	> 29.8 cfs
September	< 18.7 cfs	18.7 – 29.8 cfs	> 29.8 cfs
October	< 18.7 cfs	18.7 – 29.8 cfs	> 29.8 cfs
November	< 18.7 cfs	18.7 – 44.5 cfs	> 44.5 cfs
December	< 18.7 cfs	18.7 – 44.5 cfs	> 44.5 cfs

These thresholds are based upon flow at the U.S. Geological Survey Ipswich River at South Middleton gauge, which has a drainage area of 44.5 square miles. Therefore, 18.7 cfs = 0.42 cfsm, 29.8 cfs = 0.67 cfsm, and 44.5 cfs = 1.0 cfsm.

cfs = cubic feet per second
cfsm = cubic feet per second per square mile of drainage basin

Appendix B

Water Conservation Plan

*Drought Management Plan, dated June 29, 2000

Level 1 - Normal Winter Conditions (Oct. 1st to April 30th)

Level 2 - Seasonal Conditions (May 1st to September 30th)

Measures	Triggers to Implement
No Outdoor Watering between the hours of: 8:00 AM and 7:00 PM	In effect May 1st to September 30th each year.

Level 3 - Drought Condition

Measures	Triggers to Implement
Increased Public Education Outdoor watering allowed 3 days a week ONLY **No** Outdoor Watering between the hours of: 8:00 AM and 7:00 PM	Drought Management Plan (DMP)*- Mild Drought Stage or River Flow Level Below 0.67 cfsm.

Level 4 - Drought Condition

Measures	Triggers to Implement
Shut Off Well 1 & Well 2 Outdoor watering allowed 2 days a week Outdoor watering between the hours of: 7:00 PM and 10:00 PM ONLY	River Flow Below 0.42 cfsm and DMP* Mild Stage or Normal Stage

Level 5 - Drought Condition

Measures	Triggers to Implement
Increased Public Education Outdoor watering by hand held hoses & cans ONLY Hand Held Watering ONLY from 7:00PM to 8:00AM No filling of Swimming Pools No washing of cars.	DMP* Moderate Drought Stage & River Flow Below 0.42 cfsm or DMP* Mild Stage & River Flow Below 0.34cfsm

Level 6 - Drought Condition

Measures	Triggers to Implement
No Outside Water Use	DMP* Severe Drought Stage & River Flow Below 0.34 cfs.

Emergency Drought Conditions

Measures	Triggers to Implement
Purchase Water from outside sources (if available) and No Outside Water Use. (Purchased water to meet demand only, no replenishment of sources allowed.)	DMP* Emergency Drought Stage

Appendix C

Water Usage Mitigation Plan

Whereas the Towns of Middleton and Danvers (hereinafter collectively the "Towns") water supplies are located within the Ipswich River watershed, and

Whereas the Ipswich River Basin has been designated as a "stressed basin" by the Water Resources Commission, and

Whereas both Middleton and Danvers are licensed by the Commonwealth of Massachusetts Department of Environmental Protection ("MassDEP") for withdrawal of water, and

Whereas the water withdrawal permit is issued pursuant to authority granted to MassDEP by M.G.L. Chapter 21G, and

Whereas, pursuant to the said statute, MassDEP has issued Water Withdrawal Permit number 9P-3-17-071.01 and

Whereas the said permit requires the permittees to adopt and implement a program to mitigate water demand, so as to ameliorate and minimize depletion of the limited resources of water available within the basin in accordance with the provisions of the permit, including the 2:1 water conservation or in-basin retention of water goal,

Now therefore the Towns hereby adopt the following programs and standards:

1. **Applicability**: The following requirements shall apply to all projects:

a. for which there will be new or increased water demand; and
b. for which a building permit is required; and
c. which are permitted on or after August 1, 2006; or
d. for which applications for building permits are made on or after August 1, 2006.
.

2. No project which is subject to this Plan pursuant to paragraph 1 above shall be connected to the public water supply unless all of the following standards are met:

   a. all applicable provisions of the state plumbing code must be met;

   b. each faucet, shower-head, clothes washing machine, dish washing machine, and toilet shall be energy efficient, water saving, and shall meet the EPA's Water Efficiency Standards and as may be amended.

   c. inground irrigation system shall be equipped with a controller with a rain and moisture sensing device and shall otherwise incorporate commercially available technology to minimize water use.

3. **Impact Fee**: All commercial projects and all residential projects of three (3) or more dwelling units shall, prior to issuance of an occupancy permit, pay a fee to be determined fee to be determined in accordance with M.G.L. Chapter 44, Section 53E1/2 and calculated based upon the proposition that each project subject thereto shall pay a fee reasonably commensurate with the cost of conserving water or mitigating water loss consistent with projected water demand from the proposed project.

4. **Deposit to Fund**: All fees collected pursuant to this plan shall be deposited by the Town Treasurer in a Water Usage Mitigation Fund established pursuant to M.G.L. Chapter 44, section 53E1/2 and may only be expended for conserving water resources, reducing demand upon the public water supply, and/or water use mitigation.

    a. The Town Manager/Town Administrator shall promulgate specific guidelines for utilization of funds available in the Fund and such guidelines shall become effective immediately upon promulgation.

Appendix D

Environmentally friendly landscaping list:

1) limit area of lot clearing to no more than 50% or no more than 1/2 acre (whichever is less)

2) retain/ plant native vegetation over at least 50% of the lot area (provide guidelines or use New England Wildflower Society list)

3) limit lawn size (limit: 25% of lot size or 1/4 acre) -- substitute wildflowers, meadow plantings, butterfly gardens, native plantings

4) create rain gardens and/or vegetated swales to provide temporary water storage and enhance infiltration to groundwater

5) plant non-invasive, drought-resistant perennials, shrubs, and native tree species

6) use drought resistant grasses on limited lawn areas (fescues etc.; provide list)

7) use 2" compost in addition to loam and use mulch as appropriate

8) install cisterns (on large lots) or rain barrels (on small lots) with infiltration chambers, dry wells or other device to enhance groundwater recharge for large rain events

9) use drip irrigation systems

10) in-ground irrigation systems must be regulated by moisture sensors at a minimum, and preferably evapotranspiration-monitoring systems