

Division of Water  
 Supply  
 Department of  
 Environmental Quality  
 Engineering  
 Executive Office of  
 Environmental Affairs  
 Commonwealth of  
 Massachusetts

Volume 2, Number  
 Spring 1989

## Statewide Emergencies

Andrew Gottlieb

Due to drier than normal conditions exacerbated by an almost snowless winter, many Massachusetts water suppliers are facing water shortages this summer.

A survey of major surface water sources in March, 1989 found seven at more than 25 percent below normal levels. Groundwater elevations are also generally below normal across the state. It is expected that many supplies will not recover to normal elevations this spring. The Department is expecting numerous requests for declarations of water emergency through the spring and summer of 1989.

Under M.G.L. c21g s.s. 15,16, and 17, the Department has the authority to declare a state of water supply emergency at the request of a public water supplier. A typical declaration will include a combination of long and short term measures designed to bring about an end to the emergency. A formal declaration of water supply emergency is necessary in order for a public water supplier to enforce water use restrictions. Voluntary conservation can be requested at any time without the involvement of the Department. Municipalities not having local authority to enforce water use restrictions are urged to adopt such a measure immediately. The Department has developed a model which is available upon request.

The following municipalities are under a formal state of water emergency as of April 11, 1989:

Arlington**	Lynn**	Revere**
Ashland*	Lynnfield**	Rockport*
Bedford*	Malden**	Saugus**
Belmont**	Marble-	Shrewsbury
Boston**	head**	Somerville**
Braintree*	Marlboro**	South
Brockton	Medford**	Hadley**
Brookline**	Melrose**	Southboro**
Cambridge**	Milford	Stoneham**
Canton**	Milton**	Stoughton*
Chelsea**	Nahant**	Swampscott**
Chicopee**	Needham**	Wakefield**
Clinton**	Newton**	Waltham**
Dudley	North	Watertown**
Everett**	Raynham	Wellesley**
Framingham**	North-	Weston**
Hanson*	boro**	Whitman
Huntington	Norwood**	Wilbraham**
Leominster**	Peabody**	Winchester**
Lexington**	Plainville*	Winthrop**
Ludlow	Quincy**	Woburn**

\* Water Bank or Building Moratorium

\*\* MWRA communities

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## New Requirements for Non-Transient Non-Community Systems

Martin J. Horne

In 1986 amendments to the Safe Drinking Water Act defined a new category of public water systems called Non-Transient Non-Community (NTNC). Non-Transient Non-Community systems are facilities that have their own water source and regularly serve drinking water to 25 or more people more than six months of the year. NTNC systems may include schools, factories, and offices.

If you are such a supplier and have not received notification from DEQE, please call us at the number below. The purpose of this reclassification is to determine those systems providing water to a fixed population on a fair regular basis, and to modify the monitoring requirements for those systems.

The EPA and the State of Massachusetts have  
 Continued on page

## Zone II Delineation Important Step In Aquifer Protection

Paul Blain  
 Mike Rapacz

Many municipalities are contemplating, or have begun, town-wide groundwater resource studies as a component of their aquifer protection efforts.

When entering into a contractual agreement with their water supply consultant, municipalities should require that wellhead protection areas or Zone II delineations, completed as part of the groundwater resource study, are approvable by DEQE. If the scope of the study does not include determining the wellhead protection area/Zone II for the town's public water supply wells, this issue should be discussed by the municipality and its consultant prior to approving the scope of work.

Municipalities should obtain a copy of the 1989 Guidelines and Policies for Public Water Systems, which includes a thorough description of the Zone II delineation process. DEQE maintains that the hydrogeologic delineation of

Continued on page

## Massachusetts Public Water Suppliers 1989 Training Schedule

Yvette dePeiza

The Division of Water Supply has established its 1989 training schedule. Please be prepared to attend one of the four training seminars for public water suppliers in May and June. DWS will provide information and training on the following topics:

- ◆ Wellhead (groundwater source) protection
- ◆ Cross Connections
- ◆ Corrosion Control
- ◆ Risk Communication

Region	Date	Location	Time
Western	May 11, 1989	State House West, Springfield	10 a.m.-1 p.m.
Central	May 19, 1989	Millbury Training Center	9 a.m.-12 noon
Southeast	May 23, 1989	Lakeville Hospital	9 a.m.-12 noon
Northeast	June 2, 1989	Middlesex Community College, Burlington	9 a.m.-12 noon

Each PWS will be sent an invitation, agenda and more information in the mail prior to the above seminars.

# In The Main.

# Massachusetts Wellhead Protection Program

Roy Crystal

The Massachusetts Department of Environmental Quality Engineering (DEQE), Division of Water Supply (DWS), has received primacy for implementation of the 1986 Amendments to the Safe Drinking Water Act (SDWA).

Section 1428 of the SDWA requires that each state shall adopt and submit to the Environmental Protection Agency (EPA) a wellhead protection program by June 19, 1989. Completion of this program is necessary for DEQE/DWS to meet its SDWA responsibility and remain eligible for any funding allocated under this program. However, for a number of years prior to passage of the SDWA, DWS and DEQE as a whole have devoted significant effort to development of wellhead protection measures as part of its Groundwater Protection Strategy. Many tasks called for under federal guidelines have already been fully or partially completed.

While this prior activity has reduced the amount of new work needed to complete the major wellhead protection plan elements called for under federal guidelines, it has become evident from efforts to fully implement the wellhead protection approach that a number of gaps still remain to be filled. Recent policy decisions by DEQE and an increasing number of incidences of contamination of community public water supplies have led to an increased awareness of the need for a comprehensive state wellhead protection policy and program. In their memoranda of August 27, 1987 and April 4, 1988, respectively, former Commissioners Sylva and Hagg established Zone II as the key area for DEQE wellhead protection efforts and established an Interim Wellhead Protection Area of a 0.5 mile radius around public water supplies until Zone II is delineated. The Department plans to incorporate these protection areas into all appropriate programs, and aid municipalities to adopt protective measures for them. Further work is needed to carry out these objectives.

To address these needs, DWS decided to assess current DEQE and DWS activities related

to wellhead protection, identify any needs currently not being met, and develop a work plan that would meet these needs. The work plan, submitted to EPA's Region I Office in December 1988, was apparently the first such plan submitted in the United States. Work has been progressing on the work plan tasks since that time. The completed Wellhead Protection Program development document will, in accordance with SDWA requirements, describe how DWS will address the following required wellhead protection program elements:

- ◆ Duties of state and local agencies and public water supply systems in implementing the program.
- ◆ Determination of wellhead protection areas for each public well or wellfield.
- ◆ Identification of all potential sources resulting from human activities within the protection area.
- ◆ A program that contains, as appropriate: technical assistance, financial assistance, implementation of control measures, education, training, and demonstration projects to protect wellhead areas from contaminants.
- ◆ Contingency plans for alternative water supplies in cases of contamination.
- ◆ Siting considerations for all new wells.
- ◆ Public participation.

States are expected to make every reasonable effort to implement this program within two years after it has been submitted to EPA. DWS will discuss its wellhead protection plan alternatives in training meetings with water suppliers in May and June 1989, and is coordinating evaluation of policy issues through its Safe Drinking Water Act Advisory Committee.

Roy Crystal is Groundwater Programs Manager for the Technical Services Section of the Division of Water Supply and is responsible for directing completion of the Wellhead Protection Work Plan. □

## ■ New Requirements, continued from page 1

established drinking water testing requirements for the Non-Transient Non-Community public water suppliers. The chart below describes the contaminants that NTNC systems are required to monitor along with their frequency.

The EPA has set maximum contaminant levels (MCLs) for these substances. The MCLs listed apply to the maximum permissible level of contaminant delivered to the user's tap. For this reason the user's tap must be used as the sampling point. If a drinking water sample exceeds the MCL for one of these substances the supplier must contact the regional DEQE office within 48 hours and inform them of the violation.

Included in the monitoring requirements, NTNC systems will begin to test for volatile organic compounds (VOCs) in 1991. For the initial year of testing, groundwater supplies must be tested in the first and third quarters. Subsequent monitoring frequency will be based on system vulnerability to VOC contamination, as determined by DEQE.

All Non-Transient Non-Community public water suppliers will be sent more detailed information concerning the regulations and monitoring requirements. Any questions may be directed to the Division of Water Supply at (617) 292-5770. □

Contaminants	MCL	Monitoring Frequency
Coliform Bacteria	1 part/100ml	once every month
Sodium	20 mg/l	once every 3 yrs.
Nitrate	10 mg/l	once every 3 yrs.

# DWS Policies Superseded

Dick Young

Publication of the May, 1989 Edition of the Guidelines and Policies for Public Water Systems has superseded seven Division of Water Supply Policies. The substance of the policies has been incorporated into the new Guidelines with only minor changes. The superseded policies are cross referenced with the Guideline Sections below:

## ◆ Guideline Section 3.2.2A supersedes Policy 86-01

*Submission of Hydrogeological Reports by Hydrogeologists*

This policy was adopted to clarify the position of the Division regarding hydrogeologists performing work and submitting reports to the Division.

## ◆ Guideline Section 3.2.1.1 supersedes Policy 86-02

*Procedures for New Groundwater Source Approvals*

This policy was adopted to establish procedures to be followed in the new source approval process and to assist consultants and Division Staff in the determination of Zone II.

## ◆ Guideline Section 3.2.1 supersedes Policy 87-19

*The Definition of a New Source*

This policy was adopted to define what will be subject to the New Source Approval Process.

## ◆ Guideline Section 3.2.2H supersedes Policy 87-20

*The Determination and Management of the Protective Radius (Zone I) for Public Supply Wells*

This policy was adopted to clarify the criteria applied to the determination of the Protective Radius (Zone I) about a public supply well and provide guidance with regards to allowable land use activities within that area.

## ◆ Guideline Section 3.2.1.2A supersedes Policy 87-26

*Steps for New Source Approval for Wells with Yields Less Than 100,000 gallons Per Day*

This policy provided a streamlined new source approval process for wells designed to pump less than 100,000 gallons per day.

## ◆ Guideline Section 3.2.1.2B supersedes Policy 87-27

*Procedures Relative to the Detection of Contaminants During the New Source Approval Process*

This policy was adopted to provide procedures to be followed by DWS staff when chemicals with Drinking Water Standards or Guidelines are detected during the exploratory phase of the new source approval process.

## ◆ Guideline Section 3.2.2.Hc supersedes Policy 88-03

*Interim Wellhead Protection Area*

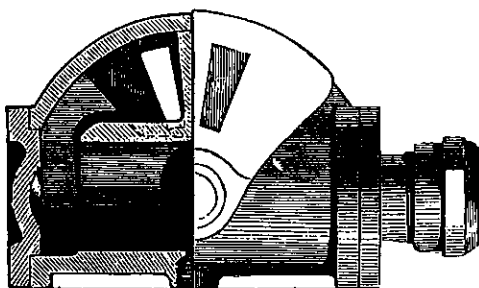
This policy was adopted to implement the Department of Environmental Quality Engineering policy statement concerning Wellhead Protection Areas, dated April 4, 1988. □

## ■ Zone II Delineation, continued from page 1

the Zone II's for public water supply wells is the most crucial component of aquifer protection activities and urges towns to include these delineations in the aquifer protection work they undertake.

The Division of Water Supply is willing to assist towns that are uncertain about whether the final product that they are contracting for will include DEQE approvable Zone II delineations.

For assistance, please contact the Technical Services Section of the Division of Water Supply in Boston. □



## In The Main

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# Water Management Update

## The Groundwater Drawdown Analysis

Marcel Hawiger

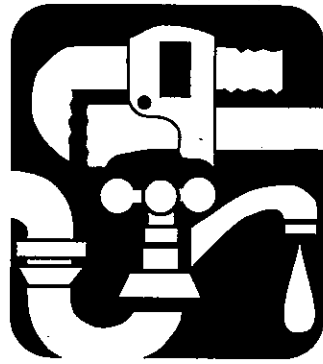
All users of water in excess of 100,000 gallons per day who do not have "grandfather rights" to their water (obtained through the registration process) must apply for a permit as stipulated in the Water Management Act guidelines.

The permit application contains several sections concerning water demand, projected water use, conservation measures and plans, and the potential effects of the applicant's water withdrawals. In order to evaluate the specific effects of groundwater withdrawals, applicants (excluding some public water suppliers who are covered by the New Source Approval process) must complete the "Groundwater Hydraulic Analysis" portion of the application.

Pumping a well causes the water table to drop. In extreme cases, this "drawdown" may cause land subsidence, salt water intrusion or pump failure. Such effects occur primarily in the western part of the country and in coastal aquifers. This is due to the large amount of groundwater use and local geology in those places. In Massachusetts, excessive groundwater drawdown can also have harmful effects such as causing the movement of contaminated groundwater, dropping the water level in nearby ponds or wetlands, or rotting the supports of Beacon Hill homes.

The purpose of the "Groundwater Hydraulic Analysis" is to determine the potential drawdown of the water table caused by a particular well. This is accomplished in two steps. The applicant must first conduct a pump test to determine the aquifer properties (transmissivity, storativity) which determine the groundwater flow pattern due to a certain rate of pumping. Secondly, the applicant must use a mathematical technique (known as the Theis analysis) to predict the drawdown of the water table due to prolonged pumping.

The results of this analysis are used to assess the potential impacts of the groundwater pumping. Of course, these impacts depend on location of the well. For this reason, the applicant must determine whether any streams, wetlands, lakes, landfills, hazardous waste sites, or other groundwater users are present within a half-mile radius of the proposed well. These locations are areas which are particularly vulnerable to the effects of a lower water table or a change in groundwater flow direction. For example, contamination in one public water supply resulted from a change in the flow direction of contaminated groundwater because it flowed towards the pumping wells rather than a nearby river.



The results of the groundwater analysis can be used to evaluate whether the well may impact some of these areas of concern. Sometimes the results of such an analysis may be inconclusive and require further work. It is difficult to predict whether a particular well will influence the groundwater flow at some distance away without a large number of observation wells.

The potential impacts of well pumping differ from, but are not totally unrelated to, the effects of stream withdrawals. One of the motivating reasons for the Water Management Act legislation was to provide a mechanism for the rational management and regulation of the entire hydrologic system. Rivers, lakes, and groundwater aquifers are hydrologically connected. The magnitude and extent of the impact of a particular withdrawal will depend not only on the size of the withdrawal but also on the nature of the stream or aquifer from which one is pumping.

The interconnectedness of the entire system is recognized in the evaluation of the impacts of well pumping on nearby surface waters. Moreover, the use of both groundwater and surface water is considered in assessing the water available in a particular watershed, the so-called basin safe yield. □

## Apply Now For Ipswich and North Coastal Basins

Cindy Dyballa

The Division of Water Supply conducted a workshop on April 12th in Beverly for those who must file water withdrawal permit applications in the Ipswich and North Coastal river basins. Permit applications in these basins are due on August 31, 1989. Applications can be obtained from program staff in Boston by calling 617-556-1077. □

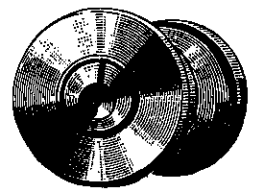
## DWS Issues First Water Management Permits

Cindy Dyballa

By the end of May, the Division of Water Supply will issue the first set of water management permits in a Massachusetts river basin under the new Water Management Act.

The first round of applicants for water withdrawal permits in the Hudson river basin completed all their application requirements by late February 28th. By law, DEQE has up to 90 days to issue permits once applications are completed.

Water management permits in the Hudson river basin will extend for up to 20 years, and will allow average daily volumes of withdrawal over the time period, along with permit conditions that will help to maintain streamflow and encourage water conservation and reuse. □



## Water Management Permit Update; Charles and Blackstone Permits

Cindy Dyballa

On February 28th DEQE accepted the first round of permit applications for water withdrawal from the Charles and Blackstone river basins. Twenty-five applications were submitted, 15 in the Blackstone and 10 in the Charles basin. These applications included requests to withdraw water for a variety of existing and proposed uses, ranging from sand and gravel excavation to cogeneration for power production and golf course maintenance. However, most applications were made from public water suppliers seeking to expand their supply.

The local public comment period, in each town where withdrawals are proposed, extended throughout March. DEQE's 30 day comment period ran from mid-April to mid-May. Applicants have until August 31st to complete other application requirements and respond to any comments made on their proposal, before DEQE can issue permits. □

## Drinking Water Week Deemed Successful

Tony Abruzese

The New England Water Works Association (NEWWA) considers National Drinking Water Week, held May 1 to May 7, a success at local levels.

National Drinking Water Week was established by the American Water Works Association (AWWA) several years ago to address drinking water issues. Efforts during water week on the federal, state and local level are made to increase public awareness on where our water comes from and how to conserve and protect our supplies.

Behind every drop of fit drinking water are the dedicated efforts of scientists, engineers, legislators, water plant owners and operators, regulatory officials and citizens groups responsible for the quality of drinking water. Because

of their efforts, we enjoy the benefits of the world's best water treatment technologies. However, more public awareness is needed to protect this precious resource.

At the local level, NEWWA has been promoting water week for the past few years, but received the greatest response this year. Local water suppliers, town officials, school departments and the media have increased public awareness dramatically.

During water week, several water treatment plant owners and operators held open houses to show the public how their drinking water is treated. Many selectman signed proclamations officially declaring Drinking Water Week in their community, and Governor Dukakis signed a proclamation declaring Massachusetts Water Week. Other efforts included: mass mailings to citizens, educating students and stories by the

media about water conservation and protection of water resources.

The NEWWA and DEQE, Division of Water Supply wish to extend their gratitude to all water suppliers, local officials and school departments for taking part in Drinking Water Week. □

### ■ Statewide Emergencies, continued from page

Suppliers whose sources are below normal are encouraged to contact the appropriate DEC regional office to discuss a declaration of water emergency. Early action will help prevent severe crisis during the traditional high use months of June-August and will facilitate DEQE review and approval of such requests. □

## New Technical Assistance Documents Available To The Public

Roy Crystal

The Division of Water Supply recently participated in several efforts which resulted in preparation of new documents that can help communities better protect their water supplies. These documents, several of which were initiated through the Cape Cod Aquifer Management Project (CCAMP), an interagency cooperative effort to develop new groundwater protection policies and tools, are now available for purchase through the Statehouse Bookstore and the National Technical Information Service (NTIS).

The participants in CCAMP were DEQE, EPA Region I Office, the Cape Cod Planning and Economic Development Commission, and the United States Geological Survey, in cooperation with the Towns of Barnstable and Eastham which served as case studies.

*The Cape Cod Aquifer Management Project: Final Report*, describing the overall project, is now available at the Statehouse Bookstore (cost: \$9.40, plus \$1.75 mailing and handling). The other major document available at the Statehouse Bookstore is *The Guide to Contamination Sources for Wellhead Protection*, a manual for control of impacts of existing and proposed land uses that may cause contamination (cost: \$13.75, plus \$2.05 mailing and handling). The manual includes a matrix which indicates which of 16 contaminants may be released in quantities that could affect a public or private supply well from 34 land uses. Separate sections describe each contaminant and land use. A major element of the manual is a listing of specific Best Management Practices (BMPs) to prevent contamination from each land use. These BMPs may be included in site plan approvals. Sample protection bylaws are included as is a discussion of regulatory techniques that may be used for controlling each land use. The manual, written by Kimberly Noake, was initiated during CCAMP and completed with financial support from DWS.

Another important document prepared during CCAMP is a *Mass-Balance Nitrate Model for Predicting the Effects of Land Use on Groundwater Quality in Municipal Wellhead Protection Areas*. Co-authored by Michael Frimpter of the USGS and John J. Donohue and Michael Rapacz of DEQE, the model can be used to guide the management of septic systems and fertilizers in aquifers and wellhead protection areas. The nitrate-nitrogen concentration in the well can be predicted by a mass-balance approach totaling the contribution of each existing and proposed land use, providing a scientific basis for deciding between alternative permitted development densities. This document is now available through the National Technical Information Service (NTIS) in Springfield Virginia (703-487-4650 for orders, NTIS No. PB89 134084/AS; A03 \$13.95 per paper copy; A01 \$6.95 microfiche copy).

Several other CCAMP documents are available through NTIS, including the report *Demonstration of a Geographic Information System for Groundwater Protection*, which describes use of this tool for risk assessment to public supply wells (NTIS No. PB89155808, cost: \$15.95 plus \$3.00 mailing and handling). In the near future, it is expected that some of these documents will also be available through the Statehouse Bookstore.

To Contact the State House Bookstore, call or write:

State House Bookstore  
Room 116, State House  
Boston, MA 02133  
(617) 727-2834 □

## DWS Developing Geographic Information System

Anita Beinikis

The Division of Water Supply has become active in developing a Geographic Information System (GIS) to better maintain and use its Water Supply Atlas. A GIS is an automated large volume database capable of data storage, manipulation, retrieval and analysis.

Any information stored in the GIS can be queried and studied based on "what if" scenarios. Maps can be generated for any situation to answer almost any question. Models, impact analyses, trend analyses and user specified queries can all be executed on a GIS.

Almost any type of data can be entered into a GIS. All that is required is a known location for each piece of data. At DWS we are working towards automating our Water Supply Atlas currently housed in flat files in our Boston office. The Atlas at present consists of USGS topographic quadrangles at 1:25,000 scale with four mylar overlays: water supplies, waste sources, drainage basins and aquifer information. The GIS will separate this information into separate data layers including town boundaries, quadrangle lines and hydrography.

These layers, or coverages, can be mapped as overlays or separately as needed. Through a series of keystrokes, the system will show what waste sources are found within a certain distance of a specific water supply. One example would be determining what waste sources fall within a one-half mile interim wellhead protection area or delineated zone II. Other options include creating an inventory plot of all public

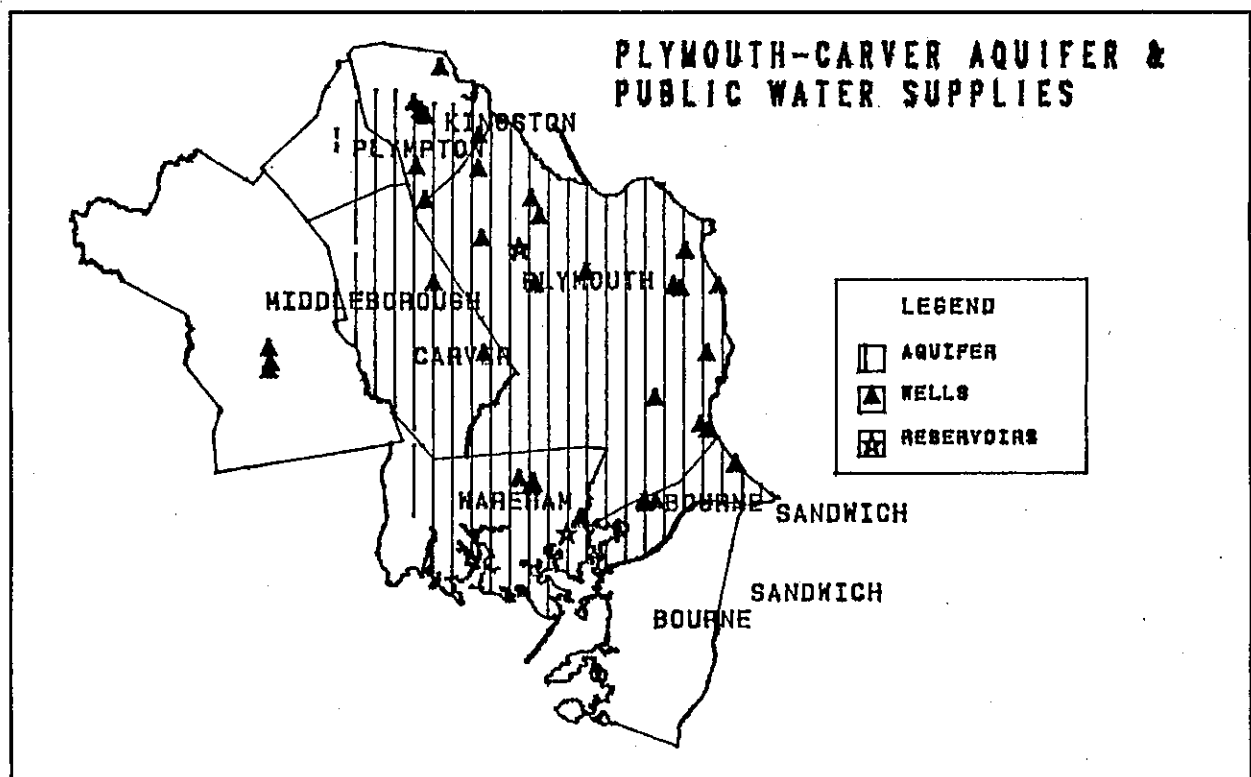
wells situated in a given town or serviced by a particular supplier.

The greatest challenge in entering all the Atlas information into the computer is the location accuracy of all these data. All point locations must be verified if they are to be used for mapping purposes. The first major task is to enter and verify the public water supplies. Often this will mean field checking and entering data in the GIS point by point (a labor intensive process). Facilitating the endeavor are paper files with known supply locations as well as the familiarity of water suppliers with their wells and reservoirs. No doubt latitude-longitude (or another standard coordinate system) will become an integral part of all paperwork required by DEQE as more and more information is transferred from paper and standard database files to the GIS. Imagine the potential of a verified, accurate and up-to-date locational database!

Achieving compatibility with a GIS is relatively easy. Existing files only require the additional input of location coordinates. Conversion programs can then put the data into a usable format ready for plotting. Anyone with a personal computer can, through proper data maintenance, have GIS-ready files.

The Division's GIS workstation consists of a Zenith 386 PC, Hewlett Packard DraftPro plotter and Calcomp 9100 digitizer with pcARC/INFO as the GIS software.

Anyone who may have comments or suggestions relevant to the GIS system may contact Anita Beinikis at (617) 556-1191. □



## Surface Water Treatment Rule Requirements

Michael Pierre

The Division of Water Supply is preparing to mail to all Public Water Suppliers (surface and ground) a draft summary of the "Surface Water Treatment Requirements." DWS will also be requesting public water suppliers using surface water, or groundwater influenced by surface water, to submit plans with a timeline, or any engineering studies already done, to meet the requirements of the draft proposal and final rule.

The general requirements of the draft Surface Water Treatment rule, as required by the Safe Drinking Water Act Amendments of 1986, are:

- ◆ All PWS using any surface water must disinfect, and may be required to filter, unless certain water quality source requirements and site-specific conditions are met.
- ◆ Treatment technique requirements are established in lieu of MCLs for Giardia, viruses,

heterotrophic plate count bacteria, Legionella, and turbidity.

- ◆ Treatment must achieve at least 99.9% removal and/or inactivation of Giardia lamblia cysts and 99.9% removal and/or inactivation of enteric viruses.

- ◆ All systems must be operated by qualified operators, as determined by the state (this has been determined to be certified operators, under 236 CMR).

- ◆ All PWS must meet treatment requirements within 48 months from the date the Federal regulations are promulgated.

The plan or engineering study to meet the requirements must consider the PWS historical and current coliform, turbidity, and TTHM levels; disinfection efficiency and methods; watershed control program; and disease outbreaks record. □



# Plumbing Code Change Requires Low Flow Toilets

Tony Abruzese

The state of Massachusetts has taken an unprecedented step toward water conservation with a change to the plumbing code. As of March 2, 1989, all new and replacement two piece flush valve, tank type toilets are required to use no more than 1.6 gallons (6 liters) per flush (gpf). Wall mounted flush valve and one piece units will fall under the 1.6 gpf requirement starting March 2, 1990.

The code change is a major step toward efficient water conservation. Each year over 400,000 new toilets are installed across the state. Since they account for an average of 38% of all domestic water use, homeowners who install a 1.6 gpf unit can expect considerable savings on water bills while conserving a valuable resource.

Up until March, the plumbing code required 3.5 gpf "water saver" toilets. Upgrading to a new 1.6 gpf from a 3.5 gpf unit can save anywhere from 9,000 to 26,000 gallons per year for a family of four—an average water savings of 57%! Replacing a 5.0 gpf or a 7.0 gpf unit with a new one can result in an annual water savings of 70% or 79% respectively. These new toilets could pay for themselves in a matter of months.

The new Massachusetts Plumbing Code requirement has so many advantages that the idea has been the subject of proposed legislation called the National Plumbing Fixtures Efficiency Act. In addition to the 1.6 gpf requirement for toilets, the legislation would call for water efficiency standards for other plumbing fixtures. In the meantime, many other states are in the process of adopting the 1.6 gpf requirement.

Years of testing have revealed that there are



## Legislative Update

Steve McCurdy

Drinking water is receiving a great deal of attention in the Massachusetts Legislature this year. This attention is good news to those of us in the business of providing quality drinking water to the citizens of the Commonwealth, as the bills presented address multiple facets of the problems we endure.

Chief among the legislation are bills which provide protection to groundwater recharge areas and watershed areas. Bills have been proposed which allow for the purchase of land to protect watershed and recharge areas, while others have been filed which restrict or prohibit various detrimental activities within those areas. Proactive measures such as these reduce the chances of contamination. We have learned the hard way that it is easier and less costly to prevent contamination than to clean it up.

Another pending bill would shift the Board of Certification of Operators of Drinking Water Facilities to DEQE. In light of the approaching changes brought on by the 1986 Amendments to the Safe Drinking Water Act, the Division of Water Supply has placed this

at the top of its legislative agenda. We encourage all water suppliers to support this legislation. You might voice your support to the House and Senate Ways and Means Committees and your Senators and Representatives.

One other water quality issue which has garnered considerable attention this year is the use and sales of POU/POE (Point of Use, Point of Entry) water filtration systems. A cross section of legislators, environmentalists, plumbers and contractors, consumer advocates, and members of the POU/POE industry are backing efforts to tighten up the sales practices of those involved in the sales and promotion of these devices.

Judging by the state of legislation that has already been introduced, we are in for an active legislative session. Your input as water suppliers, municipal officials or private citizens is key to the legislative process. Should you wish to participate in the process or just receive status updates on the various bills, you may call our legislative contact person, Steven McCurdy at 292-5779 or write c/o Steven McCurdy, DEQE/DWS; 1 Winter St., 9th floor; Boston, MA 02108. □

virtually no disadvantages involving the new code change. Issues such as double flushing, sewer line clogging and sanitary cleanliness have been addressed. In all cases the new units work just as well, if not better than, 3.5 gpf units. Several manufacturers have been certified by

the Massachusetts Plumbing Board to produce low flow toilets which come in a variety of designs and colors.

DEQE is extremely grateful to the Plumbing Board for approving the code change and thank them for their expedition in the matter. □

## Massachusetts VOC Program Test Results - Summary of 1988 Testing

Tara Gallagher

The Safe Drinking Water Act Amendments of 1986 established a nationwide testing program for 59 volatile organic compounds (VOCs) in drinking water supplies. EPA has specified maximum contaminant levels for eight of these. The VOC program regulations apply to all community water supply systems and the newly established class of non-transient non-community (NTNC) water systems, which includes businesses such as schools, factories, and hotels with their own water supply.

The VOC monitoring program follows a phased-in approach by system size. Public water suppliers serving 10,000 or more customers, which serve 88% of the state's population, began testing in January 1988. The results of 1988 testing summarized below indicate the effect of the VOC rule on Massachusetts when smaller and medium-sized systems begin testing. In January, 1989, 98 systems serving between 3,300 and 10,000 persons began monitoring for VOCs. In 1990 and 1991, respectively, 255 small community water systems and 250 NTNCs will begin testing.

In 1988, groundwater sources were tested at least twice and surface water sources were tested for four quarters. All analyses were performed by one of 23 commercial laboratories certified for the analysis of VOCs in drinking water. New detection methods enable the detection of compounds that are present in minute quantities (generally 0.5 µg/l or parts per billion) that may not have been detectable previously. All testing data is reviewed by the Division of Water Supply (DWS) as well as by public health specialists in DEQE's Office of Research & Standards (ORS). ORS determines the health effects of any detected compound(s) and advises DWS on situations where a health risk is present.

### Results by System

◆ 78 (67%) of 116 systems detected VOCs in one or more of their sources (excluding trihalomethanes [THMs]).

### Results by Source

◆ 246 (47%) of 521 sources tested detected VOCs (excluding THMs).

◆ 229 (53%) of 435 groundwater sources tested detected VOCs.

◆ 17 (20%) of 86 surface water sources tested detected VOCs.

While 47% of the 521 water supply sources tested detected VOCs at low levels, only 11 sources showed VOC concentrations that presented a potential health risk. All of these sources have been taken off-line. Groundwater sources detected VOCs at least twice as frequently as surface water sources. These results support the need for greater protection of our watershed and wellhead areas.

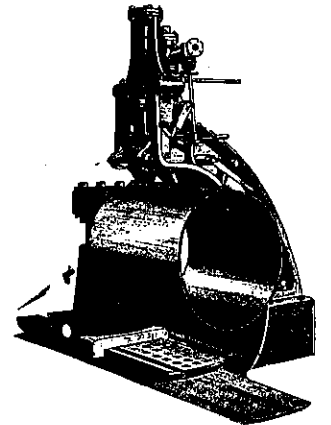
Listed below are the most commonly found VOCs (excluding THMs):

Contaminant	Total Number of Sources Detecting	Number of Groundwater Sources Detecting	Number of Surface Water Sources Detecting
Chloroform	118	118	0
1,1,1-Trichloroethane	77	75	2
Tetrachloroethylene	51	49	2
Trichloroethylene	50	49	1
Dichloromethane	25	25	0
1,1-Dichloroethane	24	24	0
1,1-Dichloroethylene	12	12	0
Toluene	12	8	4
Dichlorodifluoromethane	11	11	0

### Important Reminder for PWS Covered by the VOC Test Program

You must use a laboratory certified for VOC in drinking water in order to submit results to DEQE for compliance purposes.

A Laboratory that is certified for some categories such as trace metals may not necessarily be certified for VOC's. Please use only VOC certified laboratories. A list of these is sent out to public water suppliers each time it is updated. Lists may also be requested by calling the Division of Water Supply, Boston office at (617) 292-5770. □



## Questions to Ask When Purchasing Home Water Treatment Equipment

Yvette dePeiza

As water supply professionals, I am sure you have all been asked by your consumers about home water treatment equipment. Although the DEQE does not recommend home water treatment equipment for general use, here are some questions and helpful hints prepared by Cornell University to pass on to your consumers to help them in making an informed choice.

**Q. What exactly does the analysis of the water show? Are health hazards indicated? Should more testing be done?**

**Note:** Consumers must use the services of a Massachusetts Certified Laboratory. The DEQE/DWS has a list of all currently certified labs.

**Q. Have the product and the manufacturer been rated by the National Sanitation Foundation (NSF) or other third party organization? Was the product tested for the specific contaminant in question, over the advertised life of the treatment device (with more than 1 gallon of water), under household conditions (tap water, actual flow rates and pressures)?**

**Note:** The NSF, whose function is similar to Underwriter's Laboratory, sets performance standards for water treatment devices. Because companies can make unsubstantiated statements regarding product effectiveness, the consumer must evaluate test results of the device to determine if claims are realistic.

**Q. Does the water quality problem require whole-house treatment or will a single-tap device be adequate?**

**Q. Will the unit produce enough treated water daily to accommodate household usage? If a filter or membrane is involved, how often will it need to be changed, and how does the**

**consumer know when that change should take place?**

**Q. What are the total purchase price and expected maintenance cost of the device? Will the company selling the device also install and service it, and will there be a fee for labor? Can the consumer perform maintenance tasks, or must the water treatment professional be involved? Will the unit substantially increase electrical usage in the home?**

**Note:** The consumer must watch for hidden costs such as separate installation fees, monthly maintenance fees, or equipment rental fees. Additionally, the disposal of waste materials, such as reject water, spent cartridges from activated carbon units, and used filters, can add to the cost of water treatment and should be figured into the purchase price. Some devices can be installed by the homeowner.

**Q. Is there an alarm or indicator light on the device to alert the consumer to a malfunction? Will the manufacturer include in the purchase price a retesting of the water after a month or two?**

**Note:** Many units have backup systems or shutoff functions to prevent consumption of untreated water. Testing the water a month after the device is installed will assure the homeowner that the unit is accomplishing the intended treatment.

**Q. What is the expected lifetime of the product? What is the length of the warranty period, and what does the warranty cover?**

**Note:** The warranty may cover only certain parts of a device, so the consumer should be aware of the warranty conditions. □

## DEQE Approves Cross Connection Control Programs

Kevin Brander

DEQE has received many cross connection control program plans from across the Commonwealth. To date, more than 25 of these program plans have included a request by local water officials to be authorized to conduct installation approvals for present and future cross connections on their water system.

Acting as the Department's Designee has allowed these water suppliers to eliminate delays in protecting consumers from cross connection hazards. In many instances, programs have been coordinated with other local officials so that new construction is reviewed for proper backflow protection prior to occupancy. This procedure combined with active surveying programs for existing facilities has resulted in comprehensive cross connection control programs.

The following public water suppliers are authorized to function as the Department's Designee for plan approvals of new cross connection installations and DEQE commends them on their aggressive cross connection control efforts:

Boston Water and Sewer Commission  
Dartmouth Water Department  
Dennis Water District  
Easton Water Department  
Fall River Water Department  
Methuen Water Department  
Needham Water Division  
Oak Bluffs Water Department  
Quincy Water Department  
Rutland Water Department  
Templeton Water Department

As many program plans are currently under review, DEQE anticipates that many more will be approved in the upcoming months. □

## MWRA Emergencies

Andrew Gottlieb

In response to a joint request from the Massachusetts Water Resource Authority (MWRA) and the Metropolitan District Commission (MDC), the Department issued a declaration of a state of water emergency in the areas served by the MWRA/MDC system.

Letters were issued to the MWRA/MDC and the 44 municipalities receiving all or a portion of their water on a regular basis from the MWRA/MDC acknowledging the existence of an emergency and prescribing a variety of planning requirements. The Department requested the affected communities to begin drought contingency planning and to detail existing local plans for reducing water use during times of lower than normal precipitation. The MWRA/MDC were asked to provide their response plans as a basis for identifying system-wide measures which should be implemented to further reduce consumption as necessary.

Upon receipt of the draft local plans and the MWRA/MDC submittal, the Department will develop a preliminary drought response plan for the MWRA/MDC service area. Local input is expected to be the basis for the plan which will take into account the unique characteristics of each municipal situation. A DEQE response is expected in early May.

The MWRA/MDC situation has been caused by a combination of withdrawals in excess of the system safe yield and below normal precipitation. At this writing the main source for the system, Quabbin Reservoir, is at 67% of capacity as compared to a normal elevation of just over 80% at this time of year. Reduction of system demand to, at, or below the safe yield will provide the long term security necessary to protect the system from all but record droughts. □

## Enforcement Beat

Yvette dePeiza

The Division strongly encourages public water supply systems to be vigilant and remain in compliance with the Massachusetts Drinking Water Standards and Guidelines.

Public Water Suppliers that violate the standards know that the Division is a relentless pursuer of systems in violation. Penalties have been assessed against 15 Public Water Systems since July 1, 1986.

Since July 1, 1988, the following systems have paid penalties to the state for water supply violations:

Duck Farm Springs Water Co., Norfolk	\$500.00
Town of Brimfield	\$6,500.00
Town of Saugus	\$500.00
Worthington Fire District	\$545.00

## ORS Reviews Drinking Water Standards and Guidelines

Karen Martin

The DEQE, Office of Research and Standards (ORS) reviews and updates the Massachusetts List of Drinking Water Standards and Guidelines semi-annually. The most recent list was released in March, 1989.

ORS issues drinking water guidance for chemicals other than those with Massachusetts Maximum Contaminant Levels (MCLs). ORS derives guidelines in-house and recommends or revises EPA health advisories and proposed MCLs after careful review and evaluation.

If you would like to receive the list, or have any questions, please contact ORS at (617) 292-5509. □

## Handling Complainers

Kenneth E. Meyer

If they are your customers, it's probably because something about "their" water surprised or puzzled them.

You may have increased the level of chlorine to obtain better kill of Giardia cysts or flushed a main or hydrant or changed corrosion control practices or even chlorinated previously untreated water because there was a new well on line.

"What am I going to do?" you say "those drones in Boston and Washington insist that I do all these things."

You might consider trying — **Public Relations** — yes, initiating communication with the public. Sure, you don't have to. It's not time for a rate increase. There isn't a referendum question to shut you down. It's not something you're comfortable doing and it sounds like a royal pain. So what's in it for you?

For starters, it invites your customers to learn more about their water. It shows that you're concerned with more than reading meters, mailing bills or raising rates.

You may, with time, find that your customers have evolved into a constituency instead of a group of reactionary malcontents.

How can it be done? You have to know what is going on, what the schedule is, and how the activity might affect the consumer.

Then write all these things down and get it to the local newspaper, radio station or cable TV outlet. They'll also need the name and phone number of someone who can answer further questions.

Most people don't like unexpected changes. We can forewarn them about expected changes in their water.

There are enough surprises in life we can't predict. □

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