CITY OF CAMBRIDGE

INTEROFFICE CORRESPONDENCE

To Russell B. Higley, City Solicitor **Date** April 9, 1982

From Paul E. Healy, City Clerk **Reference**

Subject use by Cambridge residents and non-residents of the Fresh Pond area

Dear Mr. Higley:

Please be advised that the City Council at its meeting of March 29, 1982 has requested that you render an opinion as to the legality and subsequently, the feasibility of either restricting Fresh Pond to resident use only or charging non-residents a fee for the use of the area.

Your kind attention in this matter will be greatly appreciated by this office and the City Council.

PEH/mh

CITY OF CAMBRIDGE

MASSACHUSETTS

WATER DEPARTMENT
250 FRESH POND PARKWAY
CAMBRIDGE, MASS. 02138

John J. Cusack, Jr.
Superintendent

617-498-9070

24 March 1982

Robert W. Healy, City Manager
City of Cambridge
City Hall
795 Massachusetts Avenue
Cambridge, Mass. 02139

Re: FRESH POND RESERVATION & WATERSHED VEGETATIVE MANAGEMENT PLAN

Dear Mr. Healy:

In recent years much attention has been focused upon the Fresh Pond Reservation because of its attractiveness as a passive recreational area and its abundance of natural resources. Concurrent with the increased interest in the Reservation for conservation and preservation purposes, the Water Dept. has continued to use Fresh Pond as the terminal reservoir in its water supply system. Periodically, the utilization of Fresh Pond for water resource needs and the associated maintenance requirements of the Water Dept. have been considered incompatible with the conservation and recreational uses of the Reservation. To avoid any additional confusion about the impact of water resource maintenance activities within the Reservation, the Water Dept. has prepared the attached "Fresh Pond Reservation and Watershed Vegetative Management Plan". In our opinion, this plan provides a long-term natural resource management program, which will maximize the water resource development potential of Fresh Pond, and address the conservation and recreational objectives of the Reservation.

Background

In 1978 the City of Cambridge engaged the services of planning consultant Roy Mann Associates to prepare "The Fresh Pond Reservation Master Plan". The stated objectives of this master plan were twofold:

1. Protect Water Quality

2. Retain and Protect the Natural Features of the Reservation

This planning document also identifies two undesirable situations in existence on the Reservation which are unacceptable to both of the goals indicated above. These deficiencies are the shoreline erosion and the poor condition of much of the vegetation adjacent to the pond access road. Eventhough these problems are evident in numerous locations along the 2.5 mile access road, it is the intention of the Water Dept. to concentrate our restoration and replanting efforts this

season in the area between Blacks Nook and Little Fresh Pond, adjacent to the municipal golf course.

Scope of Work

The work to be performed between Blacks Nook and Little Fresh Pond can be split into two major sections, with several activities as outlined below:

Part A - (Between Water and Security Fence)

1. remove all vegetation from rip-rap; repair and/or replace rip-rap along shoreline.

2. remove all dead, diseased, dying, and non-desirable trees, scrub, and weedy vegetation adjacent to the existing security fence

3. selectively retain mature, healthy trees along the shoreline, above the rip-rap

4. re-paint existing fence black to make it less visable and to minimize the aesthetic impact

Part B - (Between Access Road and Golf Course)

1. remove all dead, diseased, dying, and non-desirable trees, scrub, and weedy vegetation

2. selectively retain mature, healthy trees

3. selectively remove large shallow rooted vegetation on steep slopes

4. selectively plant new vegetation outside access road to ultimately obtain an approximate 2.5 (horizontal) to 1.0 (vertical) sight slope line, with the height increasing toward the golf course; (note: the re-planting/re-forestation plan has been developed by the Cambridge Plant and Garden Club).

5. plant and reseed stabilized, regraded slopes to re-direct pedestrian traffic away from golf course to pond access road.

Project Objectives

By implementing the attached "Fresh Pond Reservation and Watershed Vegetative Management Plan" and completing the scope of work outlined in the section above, the Water Dept. has established the following goals for this project, listed in order of importance:

a) Protect and improve water quality by minimizing the introduction of organic contaminants

b) Stabilize the shoreline erosion conditions to prevent slope washouts and under-cutting of the pond access road

c) Restore a balanced vegetation growth by selective thinning and specific re-planting.

d) Improve aesthetics in project area by removal of dead and diseased vegetation, and re-plainting of fence

e) Isolate Water Dept. activities from golf course by means of a structured re-planting program.

Summary

The project proposed for the area from Blacks Nook and Little Fresh Pond will be a joint venture effort between the Cambridge Plant and Garden Club, and the Cambridge Water Dept. It will be a continuation of the previous combined efforts for the preservation and restoration of natural type plantings on the Fresh Pond Reservoir Watershed, which have already been successful in the re-planted areas adjacent to the Alewife Brook Parkway and the Lusitania Soccer Field site. The proposed scope of work and the project objectives have been approved by the Cambridge Dept. of Human Services, the Police Dept. and the Water Board on the local level; and furthermore, the overall concept has been endorsed by the Drinking Water Branch of the Environmental Protection Agency as good Watershed management that "should have a positive impact in improving drinking water quality for the citizens of Cambridge".

Very truly yours,

John J. Cusack, Jr.

John J. Cusack, Jr.
Superintendent

JJC/rmg

Attachment

FRESH POND RESERVATION MASTER PLAN.

The Fresh Pond Reservation Master Plan prepared by Roy Mann Associates, was published in cooperation with the City of Cambridge in 1978.

OBJECTIVES.

*The Master Plan is based upon two overall objectives; to protect water quality of the Reservoir and to retain and protect the natural features of the Reservation.

*The primary use of Fresh Pond Reservation is as a terminal reservoir for Cambridge's water supply and the site of final water treatment before distribution. All other uses of the reservation must be compatible with this use, and the overiding goal of any management program must be to protect water quality.

EXISTING SITUATION.

*Soil erosion along the shoreline and on steep hillsides and damaged and weedy vegtation throughout the Reservation are problems which require a long-term management program.

SHORELINE EROSION:

*Most of the Fresh Pond perimeter is bordered by a rip-rapped slope consisting of large boulders, cobbles, and rubble. In many places this protective armor is undercut, especially where scrubby or weedy vegetation has become established. In some areas, asphalt paths have been undercut and eroded.

VEGETATION:

*The quality and condition of vegetation varies considerably. Seasonal high water levels, vandalism, and insufficient maintenance budgets have resulted in diseased and damaged vegetation. These problems detract from the aesthetic value of the Reservation.

*Excerpts from Roy Mann Master Plan

FRESH POND RESERVOIR AND WATERSHED VEGETATIVE MANAGEMENT PLAN

GOAL:

To provide an appropriate site location with a compatible vegetative species type that will protect and yield a high quality raw water while providing a desirable atmosphere for visitors.

PRESENT SITUATION:

a) Large numbers of dead, diseased, dying and non-desirable type woody vegetation and trees.

b) Shoreline rip-rap is being disturbed and undercut with subsequent erosion.

c) Species not aesthetically correct for certain specific areas, such as cherries bordering access path (preferred food source for eastern tent caterpillar) and poison ivy along fence.

d) Vegetation is adding organics, trihalomethane precursors, to terminal reservoir.

e) Some planted and natural areas have stagnated, scrub growth taking over.

f) Perimeter slopes to access path are in poor condition, soil has been bared, compacted and eroded as a result of foot traffic.

IMPLEMENTATION GUIDELINES:

a) Remove all dead, diseased, dying, and non-desirable trees, scrub, and weedy vegetation inside and outside peripheral fence.

b) Remove all vegetation from rip-rap.

c) Selectively retain mature healthy trees along shoreline above rip-rap and high water mark.

d) Selectively plant new vegetation outside access path to ultimately achieve an approximate 2.5 to 1 site line slope, horizontal distance from high water mark to vertical distance (ie) top of mature vegetation.

e) Selectively remove large shallow rooted vegetation on steep hillsides.

f) Plant and reseed stabilized regraded slopes to include shrubs to inhibit traffic on slopes.

g) Repair and replace rip-rap on shorelines.

Developed by Water Department

THE CAMBRIDGE PLANT AND GARDEN CLUB

The Cambridge Plant and Garden Club was the 1980 winner of the Garden Club of America Founders Fund Award. It is awarded each year through a competitive proposal submitted by member clubs from all over the country.

The project submitted by the Cambridge Plant and Garden Club entailed the preservation and restoration of natural type plantings on the Fresh Pond Reservoir watershed. Over the years the Cambridge Club has raised over $15,000 for work of this type at Fresh Pond, but this $7,500 award is the largest single amount ever granted.

CCM.101

City of Cambridge

IN CITY COUNCIL

May 21, 1979

COUNCILLOR CRANE

ORDERED: That this City Council go on record congratulating the Cambridge Plant and Garden Club for their excellent job in planting bushes and shrubs along the Fresh Pond Reservation on the Alewife Brook Parkway which has proven to be most pleasing for pedestrians as well as vehicular traffic; and be it further

ORDERED: That the City Clerk be and hereby is requested to forward a suitably engrossed copy of this resolution to the Plant and Garden Club on behalf of the entire City Council.

In City Council May 21, 1979
Adopted by the affirmative vote of 9 members.
Attest: Paul E. Healy, City Clerk

A true copy,

ATTEST: Paul E. Healy

Paul E. Healy, City Clerk

CITY OF CAMBRIDGE

250 FRESH POND PKY., CAMBRIDGE, MASSACHUSETTS 02138 • TEL. 498-9070

OFFICE OF THE WATER BOARD

December 23, 1981

Mrs. Patricia Pratt
Cambridge Plant and Garden Club
11 Brown St.
Cambridge, Ma. 02138

Dear Mrs. Pratt;

The following item is excerpted from the minutes of the December 3, 1981 Water Board Meeting:

"Ms Suzanne Dworsky, a representative of the Cambridge Plant and Garden Club, presented the club's proposal for peripheral plantings around Fresh Pond. The Board thanked the Club very much for their sincere interest in maintaining vegetative growth in appropriate areas at Fresh Pond and the motion was made by Dr. Hornig that the plan be accepted and endorsed and that it be referred to the City Council for their endorsement. Seconded by Mr. Conlon. Unanimously approved."

I look forward to the implementation of a portion of this scheme in the Spring and please feel free to call me if there is any further questions or assistance we may offer.

Very truly yours

Jon M. Beekman

Jon M. Beekman
Clerk of the Board

mp

City of Cambridge
Department of Human Service Programs
51 Inman Street Cambridge Massachusetts 02139 498-9076

To John Cusack
Superintendent, Water Dept.

From Jill Herold
Assistant City Manager
for Human Services

Subject Golf Course Planting

Date: February 3, 1982

Ref:

The Golf Course maintenance staff, as well as other Department of Human Services staff, have reviewed the plans developed by the Cambridge Plant and Garden Club for planting along sections of the golf course. With the modifications to which we agreed incorporated into the final design, I am pleased that a mutually agreeable plan has been reached. We look forward to the work being completed this spring and will be happy to assist in any way we can.

City of Cambridge
Police Department

TELEPHONE
(617) 868-3400

Office of the Chief of Police

HEADQUARTERS

January 22, 1982

Mr. John J. Cusack, Jr.
Superintendent
Water Department
City of Cambridge

Dear Sir:

I was totally unfamiliar with the proposed project that the Water Department was considering at Fresh Pond in the past.

However, after reading what Mr. McGinness had proposed and the objectives that he had in mind, there is no doubt in my mind that I concur with former Chief Fratto's opinion that the project would provide greater visibility to our Officers patrolling that area and also it would decrease or eliminate trespassing for the purpose of swimming and/or the use of coverage for immoral purposes.

Yours truly,

Anthony G. Paolillo
Acting Chief of Police

AGP:smp

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J. F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203

January 26, 1982

John J. Cusack, Jr.
Superintendent
City of Cambridge Water Dept.
250 Fresh Pond Parkway
Cambridge, MA 02138

Dear Mr. Cusack:

This will respond to your letter of January 13, 1982 in which you request our opinion on the desirability of removing all vegetation from the rip-rap area around Fresh Pond.

Since decidious trees and other vegetation are a prime source of humic acid which is the precursor for trihalomethane formation as a result of chlorination and in view of recent state and federal regulation regarding the control of trihalomethanes and their public health implications, I agree wholeheartedly with your plan to limit the input of these precursors into your terminal reservoir.

The overall management plan for removing vegetation on the perimeter of the fence and planting other species away from the reservoir is good watershed management and should have a positive impact in improving drinking water quality for the citizens of Cambridge.

If there is any way in which we can help you speed this plan along, please do not hesitate to contact me.

Sincerely yours,

Jerome J. Healey, Chief
Drinking Water Branch

Report and recommendations concerning reservoir improvements at Fresh Pond Reservoir, Cambridge, Massachusetts, as proposed under Contract No. 3, Cambridge Water Department, November, 1975.

FROM: Professors William P. MacConnell and Donald L. Mader, Ph.D., Department of Forestry and Wildlife Management, University of Massachusetts, Amherst, Mass.

TO: Cambridge City Manager, James L. Sullivan and the Cambridge Water Board

Gentlemen:

Following our examination of the area around Fresh Pond Reservoir on December 18, 1975, and discussions of the problems and objectives related to the improvement program, we have a number of observations and recommendations to make concerning the project falling within our area of competence of professional forestry, watershed management and soil science.

First, we must re-iterate what we feel must be the priorities in decisions concerning watershed and reservoir management.

(1) Highest priority is the production and maintenance of water supply and water quality.

(2) Provision for other uses of watershed property, such as recreation, aesthetic, timber production, etc. is a secondary priority which can be accommodated to the degree and extent that it does not seriously impinge on water supply or water quality.

The proposed improvements consist of removal of brush and trees growing on the rip-rapped slope of the reservoir impoundment area, partly below the high-water level, and growing at the top of the banks between the edge of the pond and the surrounding fence. In addition, repair of the fence to make it more secure against both animals and humans is to be carried out. The reasons for carrying out these improvements are as follows:

(1) Removal and control of the woody vegetation in the rip-rap area will prevent further disturbance of this very expensive protective material placed on the reservoir banks to prevent erosion. Tree growth in rip-rap moves the stones about, to disturb the erosion control effect of the rip-rap.

(2) Removal of the woody vegetation will also allow better security and reduce trespass into and pollution of the immediate reservoir area inside the fence.

(3) Removal of the woody vegetation will reduce the organic matter input into the reservoir, leaves, dead branches, etc. which degrade water quality by color, organic compounds, promotion of bacterial and algal growth, and need for additional water treatment with the possibility of the formation of chlorinated hydrocarbons.

(4) Removal of woody vegetation will also reduce the excessive water losses associated with such riparian vegetative types, however, such losses are probably not of such magnitude as to be of great concern because the area involved is small.

(5) The fence repair is designed to prevent both humans and animals from gaining access to the reservoir proper with attendant pollution from swimming, picnicking, and waste materials. In addition, the fence should reduce potential vandalism. In these regards the vegetation removal and fence repair are a joint program.

Objections to the removal of the woody vegetation, particularly the larger trees, center around the reduced aesthetic value of the reservoir shore for the considerable numbers of walkers, joggers, sports enthusiasts, and adjacent residents. In addition, the habitat value of this vegetation for birds and wildlife will be lost. The objectors apparently question the validity of or the need for the removal of the

vegetation. It is wise to keep in mind that water users out number the recreationists substantially and the recreation is a secondary use.

Recommendations

In our judgment the removal of the woody vegetation from the rip-rap area and the edge of the reservoir should be carried out, according to the contract. The most important factors leading to this judgment are:

(1) The adverse effects on the rip-rap. As trees and brush reach large sizes the butt and root swell force the stones aside and in time make a fairly large opening. Death of the trees, which is to be expected because of Dutch Elm disease, the short-lived nature of most of the other species and possible flooding, will leave openings in the rip-rap subject to erosion. The protective function of the rip-rap, which is very expensive to install and repair, will be gradually lost if trees are permitted to grow in it.

(2) The increased security derived from having the shores of the reservoir free from vegetation so that trespass and pollution can be more effectively controlled.

(3) The reduction in the amount of organic matter being introduced into the reservoir with its attendant effects on water quality. It should be noted that the species of trees currently growing around the edge of the reservoir are largely elms, willows and other short-lived species. A large proportion of the elms are dead or dying from disease and the remainder will no doubt also die in the near future. The willows, poplars, and cottonwoods are also highly subject to disease and breakage. There are some more desirable specimens like sycamore, oak, and white birch but in small numbers and if they are left in the rip-rap there will be pressure to leave more trees growing there.

The woody vegetation in this treated area should be rigorously controlled in the future to avoid the large-size growth which has resulted from lack of maintenance control over a considerable period of time. This probably can be achieved by use of proper approved chemical treatments of sprouts on a 1-3 year cycle, or by annual cutting by hand. In any case, costs should be less than those incurred from a major contract such as the present one.

The fence should be repaired and put in the best condition possible to maintain security of the reservoir and prevent vandalism and pollution from swimming or other activities.

The benefits to be derived from control of the woody vegetation seem to outweigh its aesthetic value as a screen for the edge of the reservoir and the fence, and its value as bird habitat, which seems limited primarily as cover. Although we do not profess to be experts at landscaping, it appears to us that the legitimate concern for aesthetic values and wildlife habitat can be accommodated by a program such as follows:

(1) Establishment of low plantings inside the fence such as junipers, yews, and shrubs of wildlife food value so that the area does not appear barren, but at the same time the vegetation does not significantly reduce vicibility for security purposes, contribute debris to the reservoir, or create maintenance problems. Species which discourage trespass, such as multiflora rose, may have value near the fence.

(2) Similar plantings between the fence and the roadway, to the degree possible. Ideally, if the roadway were further out from the fence, a much more attractive screening system of shrubs and small trees could be established, but the cost of moving the road would probably be prohibitive.

(3) Establishment of trees and shrubs of high wildlife and aesthetic value on the opposite side of the road from the fence. The trees should be chosen for

characteristic small stature, and perhaps coniferous types to a substantial proportion to avoid large amounts of leaves blowing into the reservoir.

A question which will undoubtedly arise is whether the few particularly desirable specimens of trees on the edge of the reservoir should be retained. Although a small number (ca perhaps 10-12) would not represent a large impact and might have appreciable aesthetic value, we feel that in the long run it would be better not to retain them because of the very large and extensive root systems which might develop in the rip-rap area and the very high value which might accrue to them, making necessary removal in the future very controversial.

It seems advisable to us that the soccer field should be relocated to a more suitable active recreation area so that vandalism and pollution potential are minimized. Pollution level from dogs and other animals in the area perhaps should be ascertained to determine if control is desirable or necessary.

Another problem which interested us was the disposal of residues from settling and filtration into the reservoir. These seemed to represent a considerable volume, and perhaps a potential source of water color and other water quality problems. The practice should be thoroughly evaluated to predict the long term effect of recycling this water directly into the reservoir. It is wise to save the water, but the residue should be settled out before the water is introduced into the reservoir or at the very least the residue should be dredged out of the reservoir periodically. A simple soil test could determine if the residue is capable of growing vegetation and, if so, it could be used to cover land fill operations in Cambridge before revegetating them.

In summary, there appear to be no irreconcilable problems between primary watershed management concerns and the aesthetic and recreational concerns. Some temporary aesthetic and bird habitat losses will occur from the vegetation removal, but these can be more than compensated for by other plantings.

Respectfully submitted,

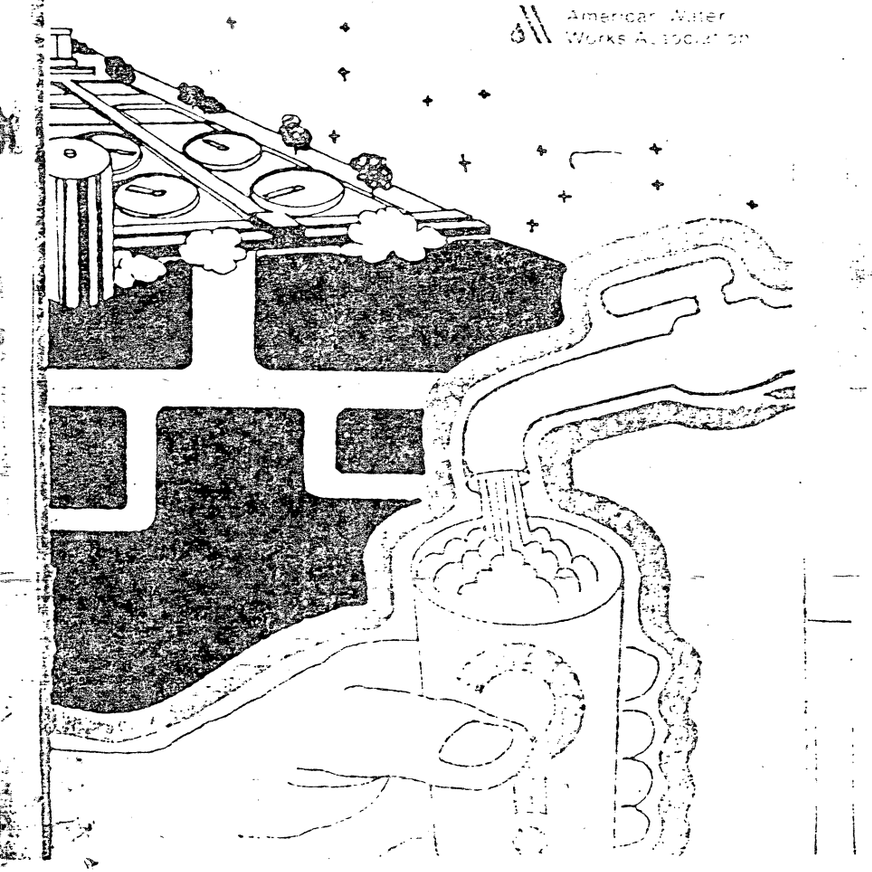
William P. MacConnell, Professor of Forestry

Donald L. Mader, Professor of Forestry

TRIHALOMETHANES IN DRINKING WATER

A GUIDE—ANSWERS TO YOUR CONCERNS AND QUESTIONS ABOUT THMs

American Water Works Association



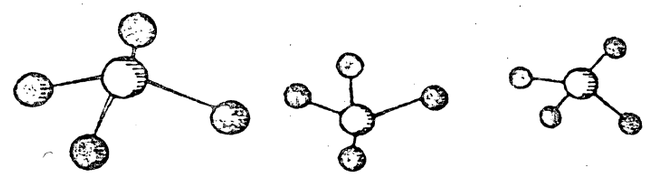
Foreword

This booklet has been prepared by the Water Quality Division of the American Water Works Association to answer some of the current questions about trihalomethanes (THMs).

On Nov. 29, 1979, the US Environmental Protection Agency (USEPA) promulgated an amendment to the National Interim Primary Drinking Water Regulations requiring certain water suppliers serving 10,000 people or more to control the concentration of trihalomethanes in the water served to their customers.

Many water suppliers have questions and doubts about this regulation, its effect on their system, and the actions they should or must take, both now and in the near future. The American Water Works Association (AWWA) has produced this informational booklet in keeping with its primary goal of providing better water for people. The questions and answers contained in this publication provide the information needed to comply with the minimum standards established by USEPA. Providing water of quality beyond those standards should always be a primary goal of a water utility. Only by striving for the best water attainable can we maintain the well-placed trust of our consumers.

Special thanks are extended to Dr. James M. Symons and many of his co-workers with USEPA for providing complete and accurate data on the regulation and its many intricate details. The comprehensiveness of this booklet is largely the result of Dr. Symons' contributions.



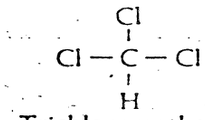
Trihalomethanes

"Trihalomethane" has only recently become a word commonly encountered in the water utility industry. The questions and answers in the first section of this booklet investigate what trihalomethanes are, what health effects they may have, how they are formed, and how their formation is related to water treatment.

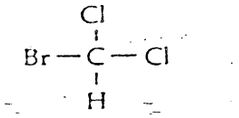
QUESTION: **What are trihalomethanes?**

ANSWER: Trihalomethanes are members of a group of organic chemicals that contain one carbon atom, one hydrogen atom, and three halogen atoms. The halogen atoms important in the formation of trihalomethanes in water are chlorine, bromine, and iodine; other halogens are not significant.

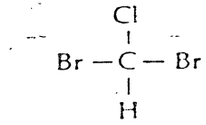
In most locations, only four of the ten possible trihalomethanes can occur in significant concentrations in chlorinated drinking water. Where iodine is used as a disinfectant, or where iodide is naturally present in the water, several iodine-containing trihalomethanes may also occur. The structural formulas of the four trihalomethanes commonly associated with chlorination are as follows:



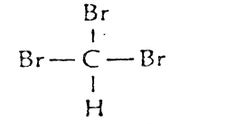
Trichloromethane
(Chloroform)



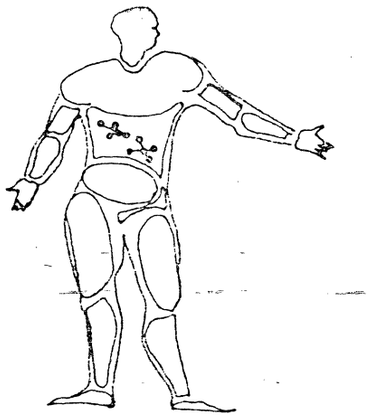
Bromodichloromethane



Dibromochloromethane



Tribromomethane
(Bromoform)



What is the potential health effect of trihalomethanes in drinking water?

The effects of chloroform on the human body are still under study, but one test has found that high doses of chloroform can be carcinogenic to rats and mice. Therefore, the US Environmental Protection Agency (USEPA) considers chloroform a potential human carcinogen. USEPA also believes that the other trihalomethanes are implicated, by association, as potential carcinogens.

Are trihalomethanes present in source (raw) waters?

Raw waters seldom contain trihalomethanes in significant concentrations.

How are trihalomethanes formed?

Chloroform, usually the trihalomethane found in the highest concentrations, is formed by the reaction of free chlorine with certain organic compounds in the water. Formation occurs during chlorination and can continue to occur as long as free chlorine is available. Other trihalomethanes are formed by the reaction of bromine or iodine with the same group of organic compounds. The reacting organic compounds are called "trihalomethane precursors," or just "precursors."[1] Trihalomethanes are frequently called "chlorination by-products."

Chlorine and/or Bromine and/or Iodine + Precursors — Trihalomethanes

Precursors are organic compounds, primarily humic and fulvic acids produced from decaying vegetation—these are frequently called "natural" organics. "Synthetic" (man-made) organics are usually not trihalomethane precursors.

Are precursors themselves significant in drinking water?

Precursors are significant because of their role in the formation of trihalomethanes and other disinfection by-products. Further, in high concentration they may cause an objectionable color in water, they may cause taste and odor problems, and they may act as nutrients for microbiological growth. The common precursors are probably not toxic or harmful to human health at the concentrations found in drinking water.

Is liquid (gaseous) chlorine more likely to form trihalomethanes than sodium hypochlorite or calcium hypochlorite?

No. Either form of chlorine, liquid (gaseous) chlorine or hypochlorites, can form a free chlorine residual in water. Any free chlorine residual, whatever its source, can react with precursors, if present, to form trihalomethanes.

Do disinfectants other than chlorine form trihalomethanes?

Recent research has shown that disinfection using chloramines and chlorine-free chlorine dioxide does not result in the formation of measurable concentrations of trihalomethanes. However, these disinfectants may form other reaction by-products, and research is still being conducted to determine the toxicity or health hazards that may be associated with the chemicals formed.

Bromine chloride and iodine can both form trihalomethanes when used to disinfect water in which precursors are available.

When trihalomethanes are created, is chloroform always the trihalomethane present in the highest concentration?

No. Depending on the characteristics of the water to be treated, any of the other three common trihalomethanes may be formed in higher concentrations than chloroform. However, chloroform is usually present in the highest concentration.

What is the source of the bromine that results in bromine-containing trihalomethanes?

Where bromide is naturally present in the water (primarily in high salinity waters), free chlorine will convert it to reactive bromine species, which will then react with precursors to form bromine-containing trihalomethanes. Further, bromine may be present in gaseous chlorine as an impurity.

Chlorine + Bromide — Bromine

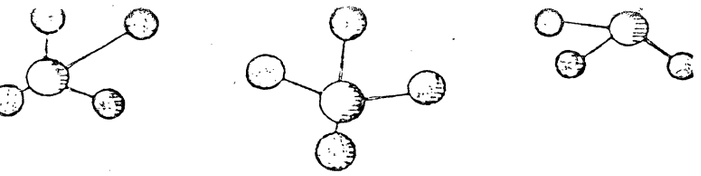
Bromine + Precursors — Trihalomethanes

Does free chlorine react with fluoride, natural or added during fluoridation, to produce similarly reactive fluorine species?

No. Free chlorine cannot convert fluoride to fluorine.

Are other by-products formed during disinfection?

Yes. Most chemical disinfectants, such as ozone, chlorine, chlorine dioxide, chloramines, iodine, and bromine chloride, act as strong oxidants and may react with many organic and inorganic compounds. Oxidation by-products are seldom found in measurable concentrations, but substitution by-products often manifest themselves as an increase in the "total organic halogen" concentration.



The Federal Regulation—Scope and MCLs

On Nov. 29, 1979, USEPA amended the Interim Primary Drinking Water Regulations of the Safe Drinking Water Act to provide a Maximum Contaminant Level (MCL) and associated monitoring and reporting requirements for total trihalomethanes (TTHMs) in drinking water. The following questions and answers explain which utilities are affected by the new regulation and define the MCL with which they must comply. Additional questions explore EPA's reasons for the scope of the regulation as promulgated.

QUESTION: **What utilities are covered by this regulation?**

ANSWER: Community water systems that serve a population of 10,000 or more and that add a disinfectant (oxidant) to the water in any part of the drinking water treatment process are covered. At the discretion of a state having primacy under the Safe Drinking Water Act, community water systems that serve a population of less than 10,000, as well as non-community systems, may be covered.

When is the regulation effective?

For community water systems serving a population of 75,000 or more, monitoring must start by Nov. 29, 1980, and compliance must be achieved by Nov. 29, 1981. For community water systems serving from 10,000 to 75,000 individuals, monitoring must start by Nov. 29, 1982, and compliance must be achieved by Nov. 29, 1983.

How many water utilities are covered by the regulation?

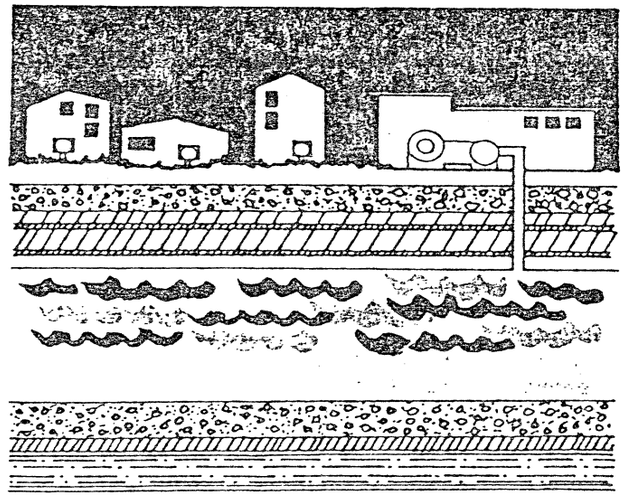
Approximately 2700 utilities serving about 167 million people. Many of these utilities have more than one treatment plant. Therefore, there may be many more "systems" covered by the regulation.

75,000 to 10,000 for inclusion in the regulation?

Of those who commented to USEPA regarding the proposed regulation of Feb. 9, 1978,[2] many, including AWWA, stated that if indeed there is a health benefit to be gained by controlling THMs, then coverage should be provided to all public water supply systems practical.[3]

Why were systems serving less than 10,000 individuals not selected for regulation at this time?

About 20 percent of the US population is served by community water systems of this size. The USEPA feels that the number of these systems—more than 57,000—makes careful supervision to avoid errors during treatment changes almost impossible. They also feel that many of these systems use groundwater and probably would not exceed the Maximum Contaminant Level for total trihalomethanes in their drinking water.



Will systems serving less than 10,000 individuals be covered by a USEPA regulation concerning trihalomethanes?

USEPA has stated that this decision will be made after some experience has been gained in implementing the current regulation.

What trihalomethanes are regulated?

Four of the ten possible trihalomethanes, chloroform (trichloromethane), bromodichloromethane, dibromochloromethane, and

Their concentrations are added together for compliance purposes (total trihalomethanes or TTHMs).[4] Note that iodine-containing THMs are not covered by the regulation and are not included in the measurement of total trihalomethanes.

Why are concentrations for the four trihalomethanes added together?

The four common trihalomethanes are formed by similar reactions, measured by similar techniques, may have toxic effects, and can be controlled by similar treatment techniques. Therefore, USEPA decided that regulating them as a group would be appropriate. Their concentrations (in weight per unit volume as $\mu g/L$, not in micromoles per unit volume) are added together to produce the parameter "total trihalomethanes."

What is the maximum contaminant level (MCL) for total trihalomethanes?

The MCL is 0.10 mg/L.

Are concentrations of 0.10 mg/L (ppm) and 100 $\mu g/L$ (ppb) identical?

The only difference between 0.10 mg/L and 100 $\mu g/L$ is the number of significant figures. Parts per million (ppm) and parts per billion (ppb) are roughly equivalent to mg/L and $\mu g/L$.

Why was the maximum contaminant level (MCL) of 0.10 mg/L chosen?

USEPA feels that achieving this concentration will provide health protection to consumers presently using drinking water containing higher concentrations. They also claim that reduction of trihalomethanes to this concentration is technically achievable and that this concentration is a reasonable national standard, taking costs into consideration. AWWA encourages water suppliers to improve water quality to the extent feasible and consistent with cost considerations.

Under what conditions might the maximum contaminant level (MCL) be revised from 0.10 mg/L?

Note that the current trihalomethane regulation is an amendment to the National *Interim* Primary Drinking Water Regulations. All MCLs will be reconsidered in the National *Revised* Primary Drinking Water Regulations, based upon an updated assessment of technological and economic feasibility, implementation experience,

and additional toxicological information. Further public comment would be involved in any decision.

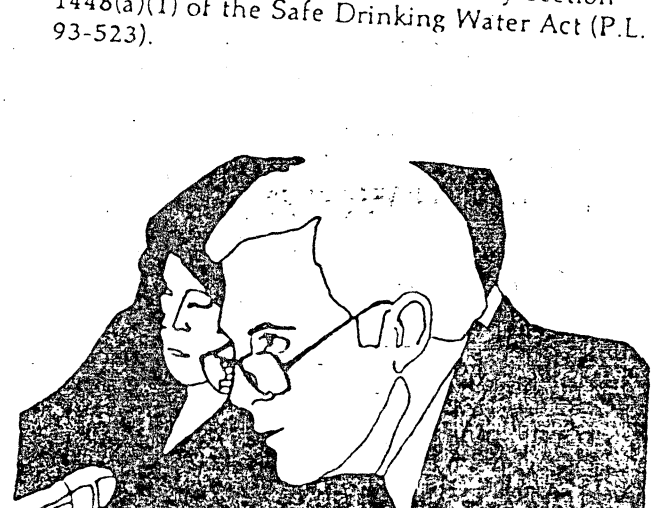
Must precursors be measured for compliance?
No.

Are any other organic contaminants in drinking water regulated?
Yes. Effective Jun. 24, 1978, Maximum Contaminant Levels for six pesticides were established, as shown in the following table:[5]

MCLs for Organic Pesticides

Organic Compound	*MCL*
Endrin	0.0002 mg/L
Lindane	0.004 mg/L
Methoxychlor	0.1 mg/L
Toxaphene	0.005 mg/L
2,4-D	0.1 mg/L
2,4,5-TP (Silvex)	0.01 mg/L

Has the regulation been challenged in court?
Yes. On Jan. 11, 1980 the American Water Works Association, the City of Englewood, Colorado, and the Capital City Water Company, a Missouri corporation, filed a Petition for Review with the US Court of Appeals for the District of Columbia Circuit, asking the court for "review of a final rule" as allowed by Section 1448(a)(1) of the Safe Drinking Water Act (P.L. 93-523).



CITY OF CAMBRIDGE

CAMBRIDGE, MASSACHUSETTS 02139
Tel. 498-9011

EXECUTIVE DEPARTMENT
ROBERT W. HEALY
City Manager

March 29, 1982

To the Honorable, the City Council:

I transmit herewith communication from John J. Cusack,Jr., Superintendent of the Water Department, enclosing the Fresh Pond Reservation & Watershed Vegetative Management Plan.

It is requested that the City Council set a hearing date to discuss this program. Representatives of the Water Department and the Cambridge Plant and Garden Club will attend the hearing to make a presentation.

Very truly yours,

Robert W. Healy

Robert W. Healy
City Manager

RWH/b

S-330

Agenda Item Number Three

Re: Request for a hearing before the Council to discuss the Fresh Pond Reservation & Watershed Vegetative Management Plan.

Request sent to City Solicitor to render an opinion Re: restricting Fresh Pond area to resident use only and possibility of charging non-residents a fee for use of the area. 4/9/82 mla

In City Council,

March 29, 1982

3/29/82

- Placed on File

Plan Introduced and

Approved by Council

Groups Concerned - According

to Mr Cusack

- No Action taken by Council -