



CITY OF CAMBRIDGE

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OFFICE OF THE WATER BOARD

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Policy Statement

ELIMINATION OF LEAD AS A WATER SERVICE CONNECTION MATERIAL

"The Cambridge Water Board supports the prohibition of lead pipes, solder and flux as materials for water service connection lines and interior plumbing. Furthermore, the Cambridge Water Department offers its customers the opportunity of replacing old lead-lined/galvanized steel pipe service connections with new copper tubing, on a discounted cost basis. In addition, the Water Department upon request will test tap water for lead."

Background

The City of Cambridge, like many other older cities historically permitted the use of lead-lined/galvanized steel pipe for water service connection materials. This practice continued until the early 1930's, at which time the Water Department began to require copper tubing, red brass pipe, and un-lined galvanized steel for small (3/4-inch thru 2-inch) service connections. This policy change was made for public health considerations, since lead had been identified as a toxic chemical.

Lead Poisoning

Lead is sometimes found in water that has been in contact with lead pipes. Since lead is a cumulative poison, habitual consumption of such water may result in lead poisoning. This may occur in waters with lead levels in the range of 0.3 to 0.5 milligrams per liter (mg/l). The current Federal and State water quality standard for lead is 0.05 mg/l, as a maximum contaminant level (M.C.L.). The danger of lead poisoning has contributed to the reluctance of waterworks officials to use lead pipes for service lines. Lead enters drinking water primarily as the result of corrosion of plumbing. The waters likely to

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dissolve lead are soft and/or acidic; and include rainwater with its usual high carbon dioxide content, and swamp waters, which may contain humic acids and carbon dioxide [1].

Too much lead in the body can cause serious damage to the brain, kidneys, nervous system and red blood cells. High levels can cause retardation, convulsions, coma and sometimes death. Low levels can slow a child's normal development and cause learning and behavioral problems. Children represent a sensitive sub-population with respect to lead toxicity. A blood screening test is the only sure way to detect lead poisoning [2].

Since lead poisoning has been recognized for many years, it has brought about the discontinuance of lead for new water service pipes; and the prohibition of lead-based paints, because of the tendency of some children to gnaw wood and eat the paint. Recognition of the fact that most of the tetraethyl lead contained in gasoline is expelled to the atmosphere as lead oxide has assisted in the program of minimizing the amount of leaded gasolines used in internal-combustion engines [3]. Airborne lead from gasoline combustion may be one of the major contributors to total lead in drinking water for systems with surface water reservoirs.

Water Quality Standards & Corrosion Control

The raw water quality characteristics of low hardness (less than 75 mg/l) and high acidity (pH less than 6.9) of the Cambridge surface water reservoirs make it capable of dissolving lead and placing it in solution. To correct this condition, the Water Department has historically added either lime or caustic soda to the water as part of the treatment process to raise the pH to alkaline levels, thereby making the water non-corrosive. Typical pH values of the treated water range from 8.1 to 8.4. Lead from service lines will not leach out with the pH adjusted this high.

As stated above, both the Federal [4] and the State [5] standards for lead in drinking water are presently set at 0.05 mg/l.

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On June 19, 1986 the Federal Drinking Water Standards were revised by the enactment of the "Safe Drinking Water Act Amendments of 1986" [6]. The Environmental Protection Agency (E.P.A.) is required by the new law to establish new maximum contaminant levels (M.C.L.) for twenty-three (23) inorganic chemicals, including lead. Preliminary reports from the E.P.A. indicate that the M.C.L. for lead will be reduced to 0.02 mg/l [7]. In addition to decreasing the M.C.L., Section 1417 of the new law prohibits the use of lead pipe, solder and flux in the installation or repair of any public water system or any plumbing connected to a public water system, effective June 1988. Section 1417 also includes a "public notice requirement" in cases of contamination due to lead content of construction materials or corrosivity of water supply sufficient to cause leaching of lead.

Since 1974 the Water Department has monitored lead levels throughout the City as part of its routine water sampling and testing program. Test results have consistently measured lead concentrations between non-detectable to a maximum of 0.005 mg/l, which is far below the proposed new standard of 0.02 mg/l.

In October of 1985, the Water Department conducted a "priority pollutant scan analysis" of raw water in the three supply reservoirs and finished-water at Payson Park. All four locations tested less than 0.005 mg/l. Copies of this report [8] are available upon request.

Service Connection Renewal Program

City of Cambridge Ordinance 19-16 specifically delegates the ownership and maintenance responsibilities of service connections to the individual property owner. Eventhough the City is not responsible for the service lines, the Water Department offers its customers the opportunity of replacing old lead-lined/ galvanized steel pipe services with new copper tubing, on a discounted cost basis. Any property owner interested in obtaining a "service renewal" should call the Water Department Business Office at 498-9070 to verify the age and material of the service line, and to obtain a price quotation for this work.

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References

1. Steel and McGhee: "Water Supply and Sewerage" 5th ed., McGraw-Hill, New York p. 182, 1979.
2. Massachusetts Department of Public Health - Childhood Lead Poisoning Prevention Program: "Lead Poisoning Facts and Guidelines", June 1985.
3. Sawyer and McCarthy: "Chemistry for Environmental Engineering" 3rd ed., McGraw-Hill, New York p. 517, 1978.
4. Federal Register, Vol. 40, No. 15, March 14, 1975, Environmental Protection Agency, "Interim Primary Drinking Water Standards".
5. 310 C.M.R. 22.00, Massachusetts Department of Environmental Engineering: "Drinking Water Regulations", March 1983.
6. 99th Congress: "Safe Drinking Water Act Amendments of 1986", June 1986.
7. Federal Register: Vol. 50, No. 219, pp. 46968 thru 46971, November 13, 1985.
8. Cambridge Analytical Associates, "Priority Pollutan Scan Analysis", October 1985.



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TEL. 498-9011

EXECUTIVE DEPARTMENT

ROBERT W. HEALY

City Manager

RICHARD C. ROSSI
Deputy City Manager

November 17, 1986

To the Honorable, the City Council:

In response to City Council Order No. 5 of February 3, 1986 regarding the impact of lead-lined pipes on water quality, I submit the attached policy statement from the Water Board entitled "Elimination of Lead as a Water Service Connection Material".

Very truly yours,

A handwritten signature in dark ink, appearing to read "Robert W. Healy", is written over a horizontal line.

Robert W. Healy
City Manager

Agenda Item # 12 S-625

Policy Statement from the Water Board entitled "Elimination of Lead as a Water Service Connection Material".

In City Council,

November 17, 1986

C. J. Dwyer

Referred to the
Environment Committee
Copy sent to the Environment
Committee 11/18/86 @