

GUIDELINES

FOR PUBLIC WATER SYSTEMS

CHAPTERS 1-12

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THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF RESOURCE PROTECTION
DRINKING WATER PROGRAM

ACKNOWLEDGEMENTS

The *2010 Guidelines for Public Water Systems*, initially published in 1979, is modeled after guidelines used in other parts of the country. MassDEP used the *Recommended Standards for Water Works of the Great Lakes, 1976*, (popularly called the *Ten State Standards*) as a model for form and content after receiving permission from the Upper Mississippi River Board of State Sanitary Engineers. We gratefully acknowledge that the *2010 Guidelines for Public Water Systems* is based largely on the *Ten State Standards*, with appropriate additions and deletions to reflect Massachusetts' practices and needs. These guidelines incorporate materials from other national organizations including, but not limited to, the U.S. Environmental Protection Agency, RCAP Solutions, and American Water Works Association.

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INTRODUCTION

The Massachusetts Department of Environmental Protection (MassDEP) is pleased to publish the *2010 Guidelines for Public Water Systems*. Last updated in 2001 and 2008, this document is intended to provide guidance to public water suppliers and their employees, MassDEP staff, and the public. In the Guidelines MassDEP may clarify interpretations of the *Massachusetts Drinking Water Regulations* (310 CMR 22.00), establish protocols for addressing site-specific problems encountered in the field, and set the regulatory framework necessary to maintain or improve the public health and welfare.

MassDEP has the authority under MGL, Chapter 111, section 160 and Massachusetts Drinking Water Regulations 310 CMR 22.00 (specifically 310 CMR 22.04) to require compliance with the Guidelines. Any person proposing to construct a new public water system or to substantially modify an existing public water system is required to comply with all applicable guidelines at the time of permit application. Any person operating an existing public water system must comply with a guideline when MassDEP provides written notification to the system requesting compliance. In addition all entities shall comply with a guideline when MassDEP requires in writing such compliance.

In the Guidelines the terms “shall” and “must” are used where practice is sufficiently standardized to permit specific delineation of requirements or where safeguarding of the public health justifies such definite action. Other terms, such as “should”, “recommended”, and “preferred”, indicate desirable procedures or methods, with deviations subject to individual consideration.

The *Guidelines* has 12 chapters, each dedicated to a distinct facet of a water supply program. The following chapters were significantly revised in this edition: Chapters 3, 4, 5, 6, and 7.

Within these Guidelines MassDEP is also reminding entities of the current requirement from 310 CMR 22.04 (8) that drinking water system components must be compliant with National Sanitation Foundation International (NSF) most recent standard NSF/ANSI 61 which now includes Annex G (weighted lead content of $\leq 0.25\%$). For more information refer to the NSF website at: <http://www.nsf.org/Certified/PwsComponents/>

MassDEP has a main office in Boston and four regional offices in Springfield (Western Regional Office-WERO), Worcester (Central Regional Office-CERO), Wilmington (Northeast Regional Office-NERO), and Lakeville (Southeast Regional Office-SERO). Appendix H of these Guidelines shows the regional boundaries and lists the cities and towns in each region. Contact numbers for the Drinking Water Program are:

Boston	617-292-5770	FAX 617-292-5696
WERO	413-784-1100	FAX 413-784-1149
CERO	508-792-7650	FAX 508-792-7621
NERO	978-694-3200	FAX 978-694-3499
SERO	508-946-2700	FAX 508-947-6557

Should questions arise during your use of this document, please contact the Boston office or the regional office for your community.

The *Guidelines* are available from the MassDEP's Web site at <http://www.mass.gov/eea/agencies/massdep/water/regulations/guidelines-for-public-water-systems.html> or may be purchased from the State Bookstores in Boston (617-727-2834) and Springfield (413-784-1376).

DEFINITIONS

Accounting Consistency: Using the same accounting principles during the current period as used in the immediately preceding period.

Accountability Controls: Control procedures that fix responsibility for the custody for asset documents or accounting records.

Accounts Receivable: An asset account reflecting monies owed to an organization from private persons/organizations for goods and services.

Angle Well: A well that is installed at an angle such that the coordinates of the center of the well screen are located at a horizontal distance of greater than 50 feet from the coordinates of the wellhead.

Annual Financial Review: A yearly examination of the public water system's financial statements.

Approved Source: A water supply source approved by MassDEP for drinking water purposes pursuant to 310 CMR 22.03(1).

Approved Yield: The maximum volume of water that may be pumped from a groundwater source in any 24-hour period, as approved by MassDEP. The public water system may pump up to 1.5 times the approved yield (in gallons per minute) for up to 16 hours in any 24-hour period for groundwater sources with an approved yield of 10,000 gallons per day, or greater, with MassDEP approval. The public water system may pump up to 5 times the approved yield (in gallons per minute) for groundwater sources with an approved yield of less than 10,000 gallons per day, with MassDEP approval, provided that the Approved Yield is not exceeded in any 24-hour period.

Asset: Something that has commercial or exchange value and is owned by a public water system.

Auditing: A systematic process of objectively obtaining and evaluating evidence regarding statements, that are often communicated to interested users.

Audited Financial Statements: Documents produced by a Certified Public Accountant/accounting professional after reviewing financial records; usually prepared annually.

Balance Sheet: Itemized statement that lists a system's total assets and liabilities to portray net worth at a particular time.

Bank: See 310 CMR 22.

Betterment: An addition or change to a fixed asset that is expected to increase its life or efficiency above general maintenance.

Betterment Fee: A fee that is charged to cover the costs of a specific capital improvement.

Calculated Approvable Yield: The maximum yield that MassDEP may establish as the Approved Yield for a groundwater source. For a new source of public drinking water, the Calculated Approvable Yield is determined from the results of the analysis of the long-term pumping test. See Section 4.3.1.5 of these Guidelines for the applicable calculations for new sources. See Section 4.9 of these Guidelines for the applicable calculations for existing sources.

Capacity Development: The process whereby public water systems acquire and maintain adequate technical, managerial, and financial capabilities to provide safe and affordable drinking water.

Capital: Funds necessary to establish or operate a public water system.

Capital Budget: Estimated expenditures for capital items in a fiscal period.

Cost-Benefit Analysis: Comparing the costs of providing a service or product with the financial benefit. In auditing, cost-benefit analysis is applied in selecting among alternate procedures for achieving stated audit objectives. It is also applied in determining whether or not to test control procedures to lower the assessed level of control risk.

Debt: An obligation resulting from the borrowing of money or from the purchase of goods and services.

Debt Financing: Raising funds for a public water system by borrowing monies from a bank or lending organization.

Debt Limit Ceiling: The legal maximum debt-incurring power of a state or locality. Debt limits are often imposed by constitutional, statutory, or local charter provisions.

Debt Service: The amount of money needed to pay interest and principal charges on an outstanding debt.

Department: The Department of Environmental Protection of the Commonwealth of Massachusetts.

Drinking Water State Revolving Fund (DWSRF): Funds appropriated by Congress to provide seed money for states to create their respective DWSRF. Funds are loaned to PWS for system improvements.

Easement: An easement is a legal restriction contained within a deed that prohibits or allows certain land uses in perpetuity.

Estimated Useful Life: The period during which an asset is expected to be useful.

Financial Capacity: A water system's ability to acquire and manage sufficient financial resources to achieve and maintain compliance with SDWA requirements. The financial resources of the water system include, but is not limited to, the revenue sufficiency, credit worthiness, and fiscal controls

Financial Statement: Written account of the financial condition of a company that includes a balance sheet and income statement.

Full Cost Accounting: A method of financial and management accounting that allocates all direct and indirect historical costs to a product or process.

Full Cost Recovery: Full cost recovery means charging fees to cover all costs incurred by a particular activity or service.

Groundwater: See 310 CMR 22.02.

Infiltration Gallery: A subsurface groundwater collection system installed adjacent to a surface water body for the purpose of inducing infiltration from the surface water body. An infiltration gallery generally consists of a horizontal screen(s) or other porous media that collects groundwater and induced surface water and routes it to a chamber from which water is pumped to a water treatment plant or distribution system.

Interim Wellhead Protection Area (IWPA): See 310 CMR 22.02 and *Appendix D* of this document.

Inventory of Capital Assets: Record of capital assets used as benchmark data in capital planning; usually developed over time.

Managerial Capacity: The ability of a water system to conduct its affairs in a manner enabling the system to achieve and maintain compliance with SDWA requirements. It is the system's institutional and administrative capabilities including ownership accountability, staffing and organization, and effective external linkages.

MassDEP: The Department of Environmental Protection

Net Available Revenue: Total Water Revenues – O & M expenses (Cash available to pay debt service expense after current O & M expenses are paid.)

O & M Expenses: Direct compensation + Benefits + Energy + Chemicals + Materials & Supplies + Outside Lab Services + Federal Taxes + State Taxes + Local Taxes. Exclude

depreciation, primary business expenses, interest payments, principal payments, other debt service, capacity improvement, advanced contributions to sinking funds, and other expenses.

Per-Capita Residential Use: Residential use divided by the total population received.

Public Water System (PWS): See 310 CMR 22.

Pump Capacity: A pump's maximum pumping rate cannot exceed the approved yield of a well expressed in gpm (approved yield / 1440 min/day) by more than a factor of 1.5 unless MassDEP approves an increase.

Regulations: The Drinking Water Regulations of Massachusetts, 310 CMR 22.00.

Revenue Requirements: The sum total of the revenue required to pay all operating and capital costs of providing service.

Safe Drinking Water Act (SDWA): A federal law, passed in 1974 and amended in 1986 and 1996, enacted to protect public health and the nation's public drinking water supply.

Sanitary Survey: A review, inspection, and assessment of a public water system by MassDEP, including but not limited to: source, facilities, equipment, administration and operation, maintenance procedures, monitoring, record keeping, planning documents and schedules, and management practices. The purpose of the survey is to evaluate the adequacy of the water system for producing and distributing safe and adequate drinking water.

Saturated Zone: See 310 CMR 22.

Segregation of Duties/Divided Responsibility: An internal control procedure whereby work on various financial tasks is distributed among numerous employees.

Source Approval Process: The step-by-step process used by MassDEP of Environmental Protection, culminating in the development of a public water source.

Spring: A natural discharge point where groundwater issues from soil or rocks in concentrated flow. Sources are not considered springs if mechanical methods are used to induce water; the collection system must not hydraulically affect the water table. Public water supply springs will be perennial springs of nonthermal origin.

Supplier of Water: See 310 CMR 22.

Technical Capacity: The physical and operational ability of a water system to meet SDWA requirements. Technical capacity refers to the physical infrastructure of the water system, including the adequacy of source water and the adequacy of treatment, storage, and distribution infrastructure. It also refers to the ability of system personnel to operate and maintain the system adequately.

Total Operating Revenues: Water Sales + Other water related revenues (connection fees, inspection fees, developer fees, usage fees, other fees and general fund revenues) Excludes interest earned, primary business revenues, fines/ penalties, and other water related revenues.

Tributary: See 310 CMR 22.

Watershed: See 310 CMR 22.

Wellfield: A series of three or more wells that are manifolded together. The wells can either be suction lifted or individually pumped (pending 310 CMR 22 revisions); however, all wells in the wellfield shall be pumping at the same time. When submersible pumps are used, the pump depths shall be no greater than 28 feet below ground level. A maximum distance of 50 feet shall be permitted between wells. A single source identification number will be assigned to the wellfield. Water quality sampling requirements shall be at the discretion of the regional office taking into consideration possible variation in water quality due to the lateral extent of the wellfield, land uses and variation in stratigraphy.

Zone A: See 310 CMR 22.

Zone B: See 310 CMR 22.

Zone C: See 310 CMR 22.

Zone I: See 310 CMR 22.

Zone II: See 310 CMR 22.

Zone III: See 310 CMR 22.

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Appendix H, MassDEP Addresses and Maps: see "[Find Your Region](http://www.mass.gov/eea/agencies/massdep/about/contacts/)" or <http://www.mass.gov/eea/agencies/massdep/about/contacts/>.

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