

CHAPTER 8

DRINKING WATER SYSTEMS AND WATER CONSERVATION

8-1 Scope

8-1.1 This chapter identifies requirements and responsibilities for protection of the quality of Navy drinking water and the conservation of water in the United States, Commonwealth of Puerto Rico, Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Marianas Islands. Navy policy with respect to foreign countries is provided in Chapter 18.

Under Executive Order (EO) 12902, Federal agency use of energy and water resources is directed towards goals of increased conservation and efficiency.

8-1.2 References. Relevant references are:

- a. 40 CFR 141, National Primary Drinking Water Regulations;
- b. 40 CFR 142, National Primary Drinking Water Regulations Implementation;
- c. 40 CFR 143, National Secondary Drinking Water Regulations;
- d. 40 CFR 144, Underground Injection Control (UIC) Program;
- e. 40 CFR 146, UIC Program: Criteria and Standards;
- f. BUMED Instruction 6240.10 of 3 February 93, Standard for Potable Water; (NOTAL)
- g. NAVFAC MO-210, Maintenance and Operation of Water Supply, Treatment and Distribution Systems (0525-LT-173-1950).

8-2 Legislation

8-2.1 Safe Drinking Water Act (SDWA). Specifies a system for the protection of drinking water supplies through establishment of contaminant limitations and enforcement procedures. Contaminant limits are established by the Environmental Protection Agency (EPA) through primary and secondary drinking water regulations.

a. Primary Drinking Water Regulations allow the EPA Administrator to set maximum contaminant levels or action levels (that may determine treatment requirements). There are several groups of contaminants for which standards are set:

- (1) Inorganics
- (2) Organics
- (3) Turbidity
- (4) Total Coliforms
- (5) Radionuclides.

b. National Secondary Drinking Water Regulations cover the aesthetic quality of drinking water. These secondary levels represent reasonable goals for drinking water quality, but are not Federally enforceable. Individual States may establish higher or lower levels, which may be appropriate, dependent upon local conditions, provided that the public health and welfare are not adversely affected.

c. States have primary responsibility to enforce compliance with national primary drinking water standards and sampling, monitoring, and notice requirements.

d. SDWA requires each Federal activity with jurisdiction over a public water system to comply with applicable Federal, State, or local requirements, whether substantive or administrative.

8-3 Terms and Definitions

8-3.1 Action Level. As defined in reference (a), the concentration of lead or copper in water, which determines, in some cases, the treatment requirements a water system is required to complete.

8-3.2 Disinfectant. Any oxidant, including but not limited to, chlorine, chlorine dioxide, chloramines, and ozone, intended to kill or inactivate pathogenic microorganisms in water.

8-3.3 First Draw Sample. A 1-liter sample of tap water collected per reference (a), that has been standing in plumbing pipes at least 6 hours and is collected without flushing the tap.

8-3.4 Injection Well. As defined in reference (d), an injection well is a "well" into which "fluids" are being injected.

8-3.5 Lead Service Line. A service line made of lead that connects the water main to the building inlet, and any lead pigtail, gooseneck, or other fitting that is connected to such line.

8-3.6 Maximum Contaminant Level (MCL). The maximum permissible level of a contaminant in water that is delivered to any user of a public water system.

8-3.7 Maximum Contaminant Level Goal (MCLG). The maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur and that allows an adequate margin of safety. Maximum contaminant level goals are nonenforceable health goals.

8-3.8 Point-Of-Entry (POE) Treatment Device. A treatment device applied to the drinking water

entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.

8-3.9 Point-Of-Use Treatment Device. A treatment device applied to a single tap for the purpose of reducing contaminants in drinking water at that one tap.

8-3.10 Public Water System (PWS). A public system for the provision of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. Such system includes: any collection, treatment, storage and distribution facilities under the control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control that are used primarily in connection with such system. A public water system is either a "community water system" or a "noncommunity water system."

NOTE:

Activities that purchase their water already treated but provide supplemental treatment such as rechlorination or softening (corrosion control) shall comply with reference (a). As noted in reference (a), activities that have water distribution and storage systems but purchase water from private or municipal utilities and do not treat or sell water are not required to meet EPA water system regulations under Part 141. However, all activities own and/or operate water supplies and are expected to comply with Navy policy.

8-3.11 Sanitary Survey. An on-site review of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation, and maintenance for producing and distributing safe drinking water.

8-3.12 Supplier of Water. Any person who owns or operates a public water system.

8-3.13 Treatment Technique Requirements. Filtration is required for public water systems supplied by a surface water source and public water systems supplied by a ground water source under the direct influence of surface water; reference (a) contains criteria for avoiding filtration. If the action level for lead or copper is exceeded, public water systems must install and operate optimal corrosion control equipment. Disinfection is required for all public water systems.

8-3.14 Turbidity. The measurement of the amount of light scattered by colloidal, suspended matter in liquid. Elevated turbidities, in drinking water, may be indicative of water quality problems.

8-3.15 Underground Injection. Underground injection means a "well injection." Well injection as defined in reference (d) means the subsurface emplacement of fluids through a bored, drilled or driven well or through a dug well where the depth of the dug well is greater than the largest surface dimension (see reference (e)).

8-3.16 Vulnerability Assessment. An evaluation by DoD that shows that contaminants of concern either have not been used in a watershed area or the source of water for the system is not susceptible to contamination. Susceptibility is based on prior occurrence, vulnerability assessment results, environmental persistence, transport of the contaminants, and any wellhead protection program results.

8-4 Requirements

8-4.1 General. Public water systems are required to comply with contaminant limitations and monitoring and enforcement procedures contained in the National Primary Drinking Water Regulations, or State requirements where the State has enforcement authority. Meeting of secondary standards is advis-

able, but not mandatory, unless required to do so by the State in which the public water system is located.

8-4.2 Sampling and Analysis. Initial sampling to characterize each specified contaminant (and any required subsequent sampling) will be conducted within required time frames and at the frequencies specified. There are different monitoring requirements for each contaminant group depending on whether the system uses surface water or ground water and on the number of people served. For more specific information refer to reference (a) Subpart C. Sample analyses must be performed in laboratories certified by EPA or the cognizant State. With the exception of required entry point samples, e.g., turbidity and fluoride, water samples must be collected at points that represent the quality of water in the distribution system.

8-4.3 Records. Records must be retained as follows:

- a. Bacteriological Results - 5 years
- b. Chemical Results - 10 years
- c. Actions Taken to Correct Violations - 3 years after action was taken with respect to the particular violation involved
- d. Sanitary Survey Reports - 10 years
- e. Variance or Exemption Records - 5 years following the expiration of such variance or exemption

NOTE:

Some State, regional or local recordkeeping requirements may vary from the above. Recordkeeping must conform to the requirements of the primary agency.

8-4.4 Noncompliance Monitoring and Reporting. Commands operating public water systems must report the failure to comply with any National

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Primary Drinking Water Regulation (including failure to comply with monitoring requirements) variances, or exemptions to the State or EPA regional office (as applicable). In addition, commands will notify all persons served by the system using the method required by reference (a). The timing and means for all notifications are prescribed in the National Primary Drinking Water Regulations. In addition, this instruction specifically requires the situation be reported to the Navy chain of command.

8-4.5 Prohibition on Use of Lead Pipe, Solder, and Flux. The use of lead pipe, solder, or flux in the installation or repair of any public water system or plumbing in residential or non-residential facilities providing water for human consumption is prohibited. Solders and flux are considered lead free if they contain less than 0.2 percent lead; pipes and fittings are considered lead free if the lead content is less than 8.0 percent.

8-4.6 Lead in Drinking Water. The Lead and Copper Rule was published in the Federal Register on June 7, 1991 and became effective December 7, 1992. Public water systems must comply with the control of lead and copper, under the Rule, by conformance to the requirements of reference (a). The purpose of the EPA lead and copper in drinking water program is to ensure that the levels of the subject metals remain below the levels associated with health risks, in treated (finished) water, at the consumer's free flowing tap. Under reference (a), for the purpose of monitoring, consecutive systems (systems that purchase their water already treated from a primary supplier) can be treated as part of the supplier, instead of a separate system.

The lead action level is exceeded if the concentration of lead in more than 10 percent of the tap water samples collected during any monitoring period conducted per reference (a) is greater than 0.015 mg/L (i.e., if the 90th percentile lead level is greater than 0.015 mg/L). The copper action level is exceeded if concentrations of copper in more than 10 percent of tap water samples collected during any monitoring period conducted per reference (a) is greater than 1.3

mg/L (i.e., if the 90th percentile copper level is greater than 1.3 mg/L).

If an action level is exceeded, additional water quality parameter samples must be taken. Optimal corrosion control treatment may also be required. Lead service lines may have to be replaced, should prescribed treatment options fail to bring lead quantities below the action level.

8-4.7 Cross-Connection and Backflow Prevention. Cross-connection control programs will apply to both interior building domestic and fire protection plumbing systems as well as exterior water distribution systems. These programs help ensure compliance with primary and secondary drinking water standards by establishing policy, procedures, and instructions for installing, repairing, maintaining, inspecting, and testing backflow preventers.

8-4.8 Public Notification. The owner or operator of a public water system that fails to comply with an applicable MCL, or that fails to comply with the requirements of any schedule prescribed under a variance or exemption, will notify persons served by the system. The notices include some specific language about the health effects of each contaminant (see specific sections of reference (a) or contact the regulatory agency for this language). Notices will be by newspaper, mail delivery, hand delivery, radio and television announcements.

8-4.9 Surface Water Treatment Rule (SWTR). The SWTR is a set of treatment technique requirements that apply to all water systems using surface water and those using ground water that is under the direct influence (UDI) of surface water. The rule requires that these systems properly filter the water, unless certain strict criteria are met. The rule also requires that these systems disinfect the water. There are no exceptions from the disinfection requirement.

Public water systems using a surface water source or ground water source (UDI) must be operated by qualified personnel who meet the requirements specified by the State.

8-5 Navy Policy

8-5.1 Navy policy is to:

- a. Comply with applicable Federal, State, and local safe drinking water regulations.
- b. Provide appropriate public notification.
- c. Promote water conservation.
- d. Implement testing requirements to determine the extent of lead exposure from drinking water at shore facilities.
- e. Use municipal or regional drinking water supplies to the maximum extent practicable.
- f. Comply with wellhead/watershed protection programs established by Federal, State or regional regulatory agencies.
- g. Ensure all Navy water supplies meet basic microbiological standards through compliance with reference (a) coliform monitoring.
- h. Require Navy suppliers of water to ensure primary water suppliers provide, minimally once a year, results of all testing performed on source water and treated water as it enters the distribution system, and to perform, minimally once a year, National Primary Drinking Water Standard (NPDWS) analyses on at least one sample from a representative point of entry into the Navy's consecutive system(s).

8-5.2 Water System Operator Certification. Navy water system operators shall meet certification requirements of the State in which the system is located.

8-5.3 Lead in Drinking Water. All Navy shore installations that own and operate a water supply should have completed sampling of drinking water coolers and outlets in priority areas (base housing, schools, day care centers, food preparation areas, and medical facilities) for lead. The sampling should have

been conducted using the protocol developed by COMNAVFACENG-COM in April 1990. Even though drinking water coolers are now required to be manufactured lead free, lead levels can still concentrate in drinking water coolers if lead service lines upstream of drinking water coolers contain lead solder. All newly installed drinking water coolers shall be sampled to ensure lead levels are below the current action level. In addition, all outlets in any priority areas that have not been sampled, and assured to be below the current action level shall be sampled. Sampling protocols shall subscribe to "first draw" tap water sampling procedures.

A copy of all test results for priority areas shall be maintained for a minimum of 10 years, and shall be made available to the water consumers, as requested. Public notification, under reference (a), coordinated via the appropriate activity authorities (Occupational Safety and Health, Public Affairs, and Medical), shall be made to all consumers whose water supply tests above the current action level. COMNAVFAC-ENGCOM shall issue guidance for activity public affairs officers.

Activities that purchase their water already treated, from a primary supplier, shall notify the supplier of lead levels that exceed the current action level, as confirmed by full protocol sampling. Mitigation measures to reduce or eliminate the source of the high lead levels shall be coordinated with the water supplier, as appropriate. Navy water systems that treat their own water or are supplied by wells shall implement mitigation procedures on their own.

8-5.4 Cross-Connection and Backflow Prevention. Every shore installation that owns and operates a drinking water supply shall ensure that a Cross-Connection Control and Backflow Prevention Program is developed and implemented. Minimum requirements of the program include: 1) establishing a mechanism to find, eliminate and prevent (whenever feasible) cross-connections; 2) establishing a mechanism to install, inspect and test backflow preventers that are required when cross-connections cannot be eliminated.

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8-5.5 Navy Water Conservation Program. A phased, Navy-wide program for conservation of water, including leak detection, shall be implemented with initial emphasis on the use of water in Navy industrial processes. The priorities of the program are economic payback and conservation of water as a declining resource.

8-5.6 Surface Water Treatment. Commands operating public water systems that receive water from surface water or groundwater under the direct influence of surface water shall comply with all Federal, State, and local regulatory requirements regarding surface water treatment.

8-5.7 Training

a. Every person involved in operations at naval shore facilities that affect drinking water quality shall receive general environmental awareness training specified in Chapter 24 of this instruction, shall receive specific comprehensive training in potable water supply and systems requirements, and must be familiar with the provisions of this chapter.

b. COMNAVFACENGCOM and Engineering Field Division (EFD) environmental professionals, Navy Regional Environmental Coordinators, shore activity technical and legal environmental staff and their managers shall have received general environmental awareness training specified in Chapter 24 of this instruction, and overview training in drinking water supply and systems requirements.

c. Drinking water supply, systems, and treatment plant operators shall have received general environmental awareness training specified in Chapter 24 of this instruction, and shall have received training and certification required by applicable State and local regulations. Where State and/or local regulations do not specify training, the following subjects shall be included in the training plan:

(1) Basic water plant and/or distribution system design

(2) Basic water plant and/or distribution system operation

(3) Basic maintenance/calibration of plant controls and equipment

(4) Water plant and/or distribution systems treatment principles

(5) Water sampling and analysis

(6) Water plant and/or distribution system documentation and reporting requirements.

8-5.8 Drinking Water System Monitoring. Every shore installation that owns and operates a drinking water supply shall develop and implement a Drinking Water System Monitoring Program. Minimum requirements of the program include: 1) performance of microbiological sampling and analysis in conformance with reference (a) coliform monitoring, and 2) performance of NPDWS analyses on at least one sample from a representative point in the system, at least once a year.

8-5.9 Underground Injection Control Programs (UICP). Section 1422 of the SDWA requires the EPA Administrator to list in the Federal Register each State that must have an UICP. All States are listed. EPA has the authority and responsibility to approve State programs. EPA has also been granted authority to administer programs in States that do not have an approved program. The purpose of the UICPs is to assure that underground injection shall not endanger drinking water sources. All underground injections are unlawful and subject to penalties unless authorized by a permit or by a rule. Navy commands shall ensure that all activities comply with Federal or State, as applicable, UIC permit requirements or permit by rule requirements.

8-5.10 Operation and Maintenance. Every activity that owns and operates a Navy public water supply shall develop and implement an operation and maintenance program applicable to the system. Minimum requirements of the program include the

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proper implementation and documentation of: emergency and preventative maintenance, system disinfection after maintenance work is performed, scheduled flushing of the system, reducing water quality problems (as needed), and implementation and documentation of a valve exercise and maintenance program.

8-6 Responsibilities

8-6.1 COMNAVFACENGCOM shall:

- a. Provide technical assistance, including requirements for cross connection control, to major claimants and activities in carrying out the requirements of this chapter.
- b. Maintain management information, including a current inventory of Navy public water systems and any violation of safe drinking water standards.
- c. Provide technical advice and prepare appropriate manuals or other forms of guidance for implementing water conservation within the Navy.
- d. Manage the Navy's lead in drinking water program and coordinate actions of the other major claimants.
- e. Provide assistance to shore activities for testing of drinking water outlets and selecting lead mitigation methods.

8-6.2 Chief, Bureau of Medicine (CHBUMED) shall:

- a. Revise instructions and other appropriate documents to reflect Navy requirements.
- b. Establish and publish appropriate additional standards of water quality and monitoring requirements for Navy drinking water systems afloat and overseas.
- c. Provide health-related advice to Navy commands in carrying out their responsibilities for drinking water quality and distribution.

- d. Ensure that health and safety issues are addressed for all lead mitigation measures considered by COMNAVFACENGCOM, especially chemical addition used to reduce lead in drinking water.

8-6.3 Major claimants shall:

- a. Implement the SDWA program requirements at their shore activities.
- b. Budget and provide funding for testing drinking water outlets and implementing interim lead mitigation measures.
- c. Plan, program, budget and provide funding for current and future requirements under the SDWA and revisions to the primary drinking water standards.

8-6.4 Commanding officers of shore activities shall:

- a. Budget sufficient resources for operations, maintenance, and repair of drinking water systems in compliance with applicable standards, including sampling/monitoring, reporting, recordkeeping, and other substantive and administrative requirements, including Navy requirements.
- b. Ensure, if commanding officer of host activity that owns, operates or uses drinking water systems, applications for applicable Federal, State and/or local permits are filed and that activity(ies) comply with EPA, State, and local drinking water requirements.
- c. Review the various uses of water at their activities to ensure that all economically practical water conservation measures are taken.
- d. Provide for proper sampling and analysis, monitoring, operations, maintenance, repair and alteration regarding the drinking water system.
- e. Ensure all personnel who collect samples and perform potable water system analyses are

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certified to do so per applicable Federal, State, and local regulations.

f. Provide resources (tuition, travel, per diem) for training operators of public water systems and ensure compliance with applicable State certification requirements.

g. Identify and submit compliance projects per Chapter 1, for environmental requirements.

h. Ensure that an adequate number of facility locations are included in the primary supplier's lead and copper sampling pool, and that appropriate action is taken, either by the primary supplier or the facility, based on reference (a) requirements.

i. Perform lead and copper monitoring, when the Navy water supply(ies) is(are) not included in the primary supplier's sampling pool.

j. Ensure that plumbing repairs made to activity drinking water systems use lead free materials.

k. Conduct vulnerability assessments.

l. Ensure that an operation and maintenance program is established and implemented at each activity. This applies to both primary and consecutive water supplies. At a minimum, the program must ensure proper emergency and preventative maintenance, proper system disinfection after maintenance work is performed, scheduled flushing of the distribution system as needed, and a valve exercise and maintenance program.

m. Ensure that a cross-connection and Back-flow Prevention Program is established and implemented at each activity.