U.S. Army Public Health Command (Provisional)
formerly U.S. Army Center for Health Promotion and Preventive Medicine

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Just the Facts...

Safe Drinking Water for Unregulated Systems

Background

Many small Army facilities receive their drinking water from water systems that are not regulated by the strict health criteria established as a result of the Safe Drinking Water Act (SDWA). Examples of such facilities may be small depots, National Guard armories, Reserve centers, range wells, and campgrounds. Unregulated systems have no real assurance that the water provided is safe. This fact sheet provides some general guidance on actions these facilities can take to ensure the safety of their drinking water.

Determining a Water System's Regulatory Status

Unregulated Army water systems are typically small water systems that are one of two types; an "individual" water system or a "purchasing" water system. An individual water system has its own source, such as a well, provides treatment, such as disinfection, and has a distribution system (e.g., pipes, hydrants, storage tank, pump). A purchasing water system buys or receives all its drinking water from a neighboring supplier and consists of only a distribution system. If you're uncertain or just don't know if your water system is regulated under the SDWA, the best thing to do is contact your State's drinking water program. The U.S. Environmental Protection Agency (EPA) maintains a list of State agencies responsible for regulating drinking water systems: http://www.epa.gov/safewater/dwinfo/index.html.

Unregulated Individual Water Systems

The Army requires unregulated individual water systems to provide disinfection. Disinfection is a critical treatment barrier protecting consumers from microbiological contaminants (e.g., pathogens). The disinfection treatment process should be checked and maintenanced routinely to ensure it is working properly. The disinfectant residual should also be measured routinely in the distribution system as well. It is best to check these at least weekly. The DOD Unified Facilities Criteria (UFC) for water supply system operation and maintenance provides good in-depth information on properly maintaining a disinfection treatment process. This UFC can be obtained through the DENIX website (www.denix.osd.mil). In addition to measuring disinfectant residual, Table 1 provides a list of other routine drinking water tests, safe and acceptable ranges for test results, and recommended monitoring frequencies. Values outside of the range may indicate a health or aesthetic problem. Your State health department or USAPHC (Prov) should be contacted for guidance. Unique situations or known contamination episodes may require more detailed or more frequent testing. Some examples are in Table 2.

Table 1. Routine Tests.

Parameter	Frequency	Typical Range	Affects….
Coliform Bacteria	quarterly	Absent	H
Nitrate	annually	<5 mg/L*	H
pH	annually	6.5-8.5 units	†
Sulfate	once/3 years	<250 mg/L	H/A‡
Corrosion Index**	once/3 years	Positive value	**
Lead	at least one time	<0.015 mg/L	H

H – Health, A – Aesthetic

*The Health limit for nitrate is 10 mg/L. However, there is no safety factor in that limit. Values over 5 mg/L should be closely monitored.

†pH affects the corrosivity of water and the disinfection process.

‡High concentrations may have laxative effects on non-acclimated personnel.

**Corrosion index is calculated using values of water temperature, pH, total dissolved solids, alkalinity and calcium hardness. Corrosive water can deteriorate plumbing and can leach harmful concentrations of metals, such as lead, into the water.

U.S. Army Public Health Command (Provisional)
Aberdeen Proving Ground, MD 21010-5403
Commercial 410-436-3919 or DSN 584-3919
Email: Water.Supply@amedd.army.mil
http://chppm-www.apgea.army.mil/dehe/pgm31/

Table 2. Triggers for Additional Sampling.

Conditions	Parameters to Test
Recurrent gastro-intestinal illness	Coliform bacteria
Household plumbing contains lead or corrosion of pipes	Lead, copper, corrosion index
Radon in indoor air or geographic region is radon rich	Radon
Discolored water	Manganese (black), iron (reddish, orange)
Objectionable taste or smell	Hydrogen sulfide, metals
Water appears cloudy, frothy	Color, detergents
Nearby areas of intensive agriculture	Nitrate, pesticides, coliform bacteria
Coal or other mining operations nearby	Metals, pH, corrosion index
Gas drilling operation nearby	Chloride, sodium, barium, strontium
Odor of gasoline or fuel oil, nearby gas station or fuel storage tanks	Volatile organic compounds (VOC)
Dump, junkyard, landfill, factory, or dry-cleaning operation nearby	VOCs, total dissolved solids (TDS), sulfate, chloride, metals
Salty taste, seawater or a heavily salted road nearby	Chloride, TDS, sodium

Unregulated Purchasing Water Systems

Purchasing water systems that receive their water from a regulated supplier can assume that their drinking water is safe when it arrives at the facility. This can be verified by requesting a copy of the supplier's annual water quality report. To better characterize actual water quality, Army facilities purchasing their drinking water may want to request that their supplier sample at a location near the point-of-purchase or sample a building or two on the facility.

Distributed Water Quality

The quality of drinking water received at the tap is affected by conditions within the distribution system. Bacterial regrowth, cross-connections, corrosive water and deteriorating plumbing materials may add contaminants to the drinking water after it leaves the treatment facility. Proper and conscientious operation and maintenance of the distribution system is the only protection available from such deterioration of drinking water quality. Most importantly a disinfectant residual should be detectable in ALL portions of the distribution system to protect against microbial contamination. Other distribution system maintenance concerns include proper cross-connection control, maintenance of adequate pressures, flushing of the mains, especially in low water use areas, and regular inspections and cleaning of storage tanks. Last, but not least, buildings' interior plumbing also requires maintenance. Flushing taps in buildings with low water use helps to remove stagnant water of deteriorating quality. Lead concentrations in tap water can be greatly reduced by routine morning flushing prior to use.

Further Assistance

Contact the USAPHC (Prov) Water Supply Management Program for technical assistance on all drinking water issues. We can be reached at the address, phone or email listed on the front of this fact sheet.