

OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION
DEPARTMENT OF CONSUMER AND BUSINESS SERVICES

PROGRAM DIRECTIVE

Program Directive A-237

Issued 4/10/2000

Revised: 7/3/2006

Subject: Water Quality Evaluation

Referenced Codes/

Directives: OR-OSHA has administrative rules that address the potability of water in relation to sanitation, hand labor operations, and housing:

Agriculture

OAR 437-004-1105(3)(a)(A)

OAR 437-004-1110(7)(a)

OAR 437-004-1120(7)(a)

General Industry

OAR 437-002-1910.141(b)(1)(i)

OAR 437-002-0142(8)(a)

Construction

OAR 437-003-1926.51(a)(1)

Forest Activities

OAR 437-007-0245(3)

Purpose: This directive establishes field procedures for OR-OSHA staff who will evaluate the adequacy of potable water from drinking water sources such as public or private water systems, wells or springs. It concerns the bacteriological quality of potable water meeting Department of Human Services, Oregon State Health Services (DHS/OSHS) drinking water standards. Chemical contaminants are not covered by this directive.

Background: OR-OSHA has rules governing water quality in agriculture, general industry, construction and forest activities. Field sanitation and labor housing are predominant areas of concern. This directive provides instructions for consistent and uniform assessment of these water quality standards.

Scope: This instruction applies OR-OSHA wide.

Action: This directive incorporates important definitions, procedures and citation guidance associated with enforcement of water quality standards.

(A) Definitions

- (i) Potable water means water meeting the bacteriological and chemical quality requirements in OAR Chapter 333, Division 61, Public Water Systems, of Oregon State Health Services (OSHS). With agricultural field sanitation for hand labor work, potable water must meet the quality standards in 42 CFR Part 72, U.S.

Public Health Service Drinking Water Standards. Water meeting either standard is potable.

- (ii) Public water system means a system for the provision to the public of piped water for human consumption, if such system has more than 3 service connections or supplies water to a public or commercial establishment which operates a total of at least 60 days per year, and which is used by 10 or more individuals per day or is a facility licensed by the Division. A public water system is either a "Community water system," a "Transient Non-Community water system," a "Non-Transient Non-Community water system" or a "State Regulated water system". (OAR 333-061-0020(94))

(B) Procedures for Evaluating Water Systems

Water systems include a public water system, individual wells or springs.

Public water systems are required to be maintained and tested regularly by a local water district or water system owner. In those cases independent sampling of the water supply is not necessary unless specific circumstances indicate some defect is present, such as poorly maintained components of the water system, evidence of cross connections, reports of waterborne-related illness among housing occupants, or similar examples. A referral must be made to the local health department when such conditions are established. For a public well where 10 or more people use it for at least 60 days, a referral must be made to the Oregon Health Division; the contact person is Tom Charbonneau, P.E., at (503)-731-4317, extension 749.

Where individual wells or springs provide the drinking water for housing occupants, compliance officers will:

- (i) Document the condition of the wellhead, e.g., accessibility, seal, proper drainage away from wellhead, or other conditions (wellhead terminates above grade, is at least 100 feet from drainfield or other sewage disposal). The purpose of documentation is to support any alleged violations where contamination has been found through water sampling. If there is concern about the overall adequacy of a water supply, a referral to the local health department should only be made following consultation with your manager.
- (ii) Determine frequency of use of the well apart from seasonal occupancy of the site. If a well is used only during seasonal occupancy, water lines should be flushed extensively and tested prior to use to assure potability. Operator(s) of migrant housing must assure a potable water supply through bacteriological analysis prior to opening

housing for seasonal use. For housing occupied year-round, water sampling may be indicated based on observed conditions such as those listed in (i) above.

- (iii) Conduct water sampling on a well or spring if indicated. Collect one sample using aseptic technique from uncompromised sample taps such as a hose bib or a faucet without a swivel connection (kitchen-type faucet is unacceptable), and aerator(s) removed prior to sample collection. Allow cold water source to run for a minimum of three minutes to flush the line prior to sample collection.

Certified water testing laboratories use chromofluorogenic methods to test for coliforms. Common methods include Colilert, Colisure, Colitag, and Ready-Cult. These test for both total coliform and *E. coli* bacteria, and results can be read within 24 hours. Any of these methods are acceptable. Water samples must be analyzed within 30 hours of being drawn to obtain reliable results.

Compliance officers will not measure chlorine levels in chlorinated water systems or supplies. Make note of whether or not the water being sampled has been chlorinated.

Appendix A outlines water sample collection procedures as recommended by OSHS that OR-OSHA staff must follow. Sample bottles are obtained from the OSHS Public Health Laboratory or other state-certified water testing lab. Samples need to be submitted directly to the OSHS Public Health Laboratory for bacteriological analysis.

(C) Procedures for Evaluating Portable Water Containers

Unsanitary conditions related to a portable water container can be addressed by considering the following: (1) the use of common drinking cups or dipping utensils is prohibited; (2) portable containers must be made of impervious, nontoxic materials that protect the water from contamination; (3) portable containers must be washed with soap and water and sanitized at least every seven days.

If water sampling is indicated, collect one water sample directly from the portable container without flushing the spigot. This will preserve limited water resources and reflect field-use conditions of the water supply. To support an alleged violation of drinking water standards, the source must be sampled to assure it is not contaminated.

Have the sample analyzed as indicated in section (B), paragraph (iii) above. A positive result, i.e., presence of coliform bacteria, indicates contamination of the portable container, which requires immediate cleaning and sanitizing. Follow-up sampling of the water supply may be

required if a portable container is no longer suspect and questions remain about water quality.

Where bottled water is provided by an employer for the individual use of their employees, water sampling of such containers will not be conducted by OR-OSHA. The employer's responsibility is to provide sufficient potable drinking water consistent with the environmental conditions encountered by workers. For example, hot and/or humid weather conditions may present workers with heat cramps, heat stress, heat stroke or similar heat-related symptoms.

(D) Citation Guidelines

This directive relies on the presence or absence of coliforms rather than the number of colony-forming units per milliliter (CFU/ml). A person from the laboratory will call if a presence of coliforms is found. The water lab will notify the compliance officer submitting the water sample of test results. When positive results are reported, follow the steps outlined below:

- (i) Where a water supply is in use, i.e., human consumption possible, and a positive result for Total Coliforms is made, cite the applicable standard as *de minimis* when clean and sanitary conditions are documented. For example, portable water containers maintained as indicated in section (C) above would fall in this category, as long as the source has been sampled and is not contaminated.

An "Other-Than-Serious" condition exists when clean and sanitary conditions are not documented.

OSHS advises that boiling water is not required where only total coliforms are present. A referral to the local health department is not required. Compliance officers can use professional discretion in deciding whether or not the specific circumstances necessitate contacting the local health department.

- (ii) Where a water supply is in use, i.e., human consumption possible, and a positive result for Total Coliforms and *E. coli* is made, cite the applicable standard as Serious. The water supply requires chlorination to remove contamination. The water supply needs to be removed from service immediately. (OSHS recommends not to shut off a water supply completely, since there is more risk of cross connection contamination.) An alternative water supply may be needed while the well is chlorinated. Consider alternatives such as orders for boiling water, provision of bottled water, etc. when assessing the need for a red-tag. A referral to the local health department is required.

Training: OR-OSHA will ensure that all safety and health compliance officers conducting inspections where water quality is evaluated receive training, including this

directive and other appropriate directives.

APPENDIX A

PROPER MICROBIOLOGICAL SAMPLING TECHNIQUES

These procedures are published by the Oregon State Health Services for use in the collection of water samples. OR-OSHA will follow these techniques except for testing and recording residual chlorine levels (see items 4 and 8).

Proper sampling techniques are extremely important in obtaining accurate water quality information. An improperly taken coliform sample may indicate bacteriological contamination of your water when the water is actually safe. You can avoid the cost of additional testing by using good sampling procedures.

Carefully follow these steps in taking a sample for bacteriological testing:

1. Select the sampling point. The sampling point must be a faucet from which water is commonly taken for public use.
 - a. The sampling point should be a non-swivel faucet.
 - b. Remove any aerator or screen and flush.
 - c. It should not be a faucet that leaks, permitting water to run over the outside of the faucet. Leaking faucets can promote bacterial growth.
 - d. If an outside faucet must be used, disconnect any hoses or other attachments and be sure to flush the line thoroughly (see Step 4).
 - e. Do not use fire hydrants as sampling points. Do not dip the bottle in reservoirs, spring boxes or storage tanks in order to collect the sample.

If you have any questions about proper sampling points, please contact your certified laboratory, county health department, or the Oregon Health Division.

2. Use only sample bottles provided by the lab specifically for bacteriological sampling. Coliform bacteria tests require specially prepared sample bottles. These bottles should not be rinsed before sampling. A chemical placed in the bottles by the lab is necessary for correct test results. Keep several bottles on hand.
3. Don't open the sample bottle until the moment of filling. This helps prevent contamination of the sterile sample bottle.
4. Flush the line. Run the water through the faucet for three to five minutes before opening the bottle to take the sample. If your water system is chlorinated, measure the free chlorine residual before collecting the sample and record the residual on the lab form.
5. Uncap the sample bottle. As you do this, hold the bottle near the base and be sure not to put your fingers inside the sample bottle or on the inside of the lid. Do not set the lid down while taking the sample. Any of these things can contaminate the sample.

6. Reduce the water flow to a steady stream and gently fill the bottle, leaving an air space of at least one-half inch at the top. Remember, don't rinse the bottle before filling it. And be careful not to splash out the chemical already in the bottle.
7. Replace the cap immediately. Be sure that it's tight so it can't leak. If you drop the lid or think you have contaminated the sample, do not use it. Use another bottle and collect a new sample.
8. Label the sample bottle. Completely fill out the form provided by the lab. The information accompanying the sample must include:
 - a. Public Water System identification number
 - b. Date and time sampled
 - c. Location sampled
 - d. Name of person collecting sample
 - e. The sample type: "routine," "repeat," or "special"
 - (a) Routine: Samples collected on a regular basis to monitor for contamination.
 - (b) Repeat: Samples collected following a "Present" (positive) routine sample. Usually four repeat samples must be collected. This figure is based on system size.
 - (c) It is important to include the date of the initial positive routine sample for which the repeat samples were taken. A space is provided for this in the middle section of most forms.
 - (d) Special: Samples collected for other reasons. Examples: a sample collected after repairs to the system and before it is placed back into operation, or a sample collected at a well head prior to disinfection.
 - f. Free chlorine residual, if your system is chlorinated. The residual should be measured at the time of sample collection.
9. Package the sample for delivery to the lab. Be sure to include the lab form. The samples should be kept cool at all times. If mailing, use the container provided by the lab.
10. Mail or deliver the sample to the lab immediately. The lab cannot accept samples older than 30 hours. The water quality of the sample has changed too much by then to give correct results.

Procedures taken from AWWA manual entitled "Safe Water. A Fact Book on the Safe Drinking Water Act for Non-Community Water Systems."