

**Very Small Water System Operators' Guidebook
to Preparing for Certification**

**Prepared by:
Association of Boards of Certification**

**Publication Submitted to:
U.S. Environmental Protection Agency**

Agreement Number X-980563-01-0

June 15, 2000

June 16, 2000

Mr. Bill Chamberlain
OW-136
USEPA REGION 10
1200 Sixth Avenue
Seattle, WA 98101

Dear Mr. Chamberlain:

The Association of Boards of Certification (ABC) is pleased to provide you with the *Draft Very Small Water Systems Operators' Guidebook to Preparing for Certification* prepared for the US Environmental Protection Agency under Agreement Number X-980563-01-0. The purpose of the *Guidebook* is to assist operators of very small community and nontransient noncommunity public water systems by providing a job task Guidebook that relates to the critical knowledge required to competently operate their water systems. The *Guidebook* identifies the relevant provisions of the EPA *Guidelines*, job responsibilities and job tasks (NTK), exam specifications, review questions, and additional information relating to training, technical references, and information resources.

ABC hopes that the *Guidebook* will provide a useful information source to the operators of very small water systems in all states as they prepare for certification as required by the *Guidelines*. The *Guidebook* will enable the operator to better understand the provisions and purpose of the national guidelines, their contribution to providing safe drinking water to their community, the requirements for certification, and what they need to know to pass the certification examination.

Sincerely,

Stephen W. Ballou Ph.D.
Executive Director

Table of Contents

Introduction and Purpose of the Guidebook	1
Summary of the National Certification Guidelines	2
Need-to-Know Job Tasks and Capabilities	4
Exam Specifications	7
Sample Test Questions	8
References and Correct Answers	19
Training Opportunities and Resources	24
State Certification Programs	25

Introduction and Purpose of the Guidebook

The purpose of this guidebook is to help operators of very small water systems serving a maximum population of 100 understand the provisions and purpose of the *Final Guidelines for the Certification and Recertification of the Operators of Community and Nontransient Noncommunity Public Water Systems*. This guidebook describes the certification requirements of the EPA *Guidelines*, operator need-to-know job tasks and capabilities, exam specifications, sample test questions, and additional information relating to operator training opportunities.

Summary of the National Certification Guidelines

The *Final Guidelines for the Certification and Recertification of the Operators of Community and Nontransient Noncommunity Public Water Systems*¹ require that all community and nontransient noncommunity public water systems have a certified operator in responsible charge. A community water system is defined by the EPA as a public water system that provides water “to at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.” A nontransient noncommunity water system is defined by the EPA as a “public water system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year” (p. 5921, section IV).

The objectives of the *Guidelines* are to ensure that:

- “Customers of any public water system be provided with an adequate supply of safe, potable drinking water.
- Consumers are confident that their water is safe to drink.
- Public water system operators are trained and certified and that they have knowledge and understanding of the public health reasons for drinking water standards” (p. 5919, section II.A).

To achieve these objectives the EPA developed the following operator certification guidelines. Please note that the EPA guidelines are minimum requirements. States may impose more strict requirements so it is essential for operators to contact their State Certification Program listed in the last section of this guidebook for specific state requirements.

Regulations for Certification

Each community and nontransient noncommunity water system must be under the responsible charge of an operator certified at a level equal to or greater than the system classification. This person has the authority to make decisions that affect water quality or quantity. In addition, “all operating personnel that make process control/system integrity decisions about water quality or quantity that affect public health must be certified” (p. 5919, section II.C.2). A certified operator must be available during each operating shift.

Requirements for Certification

To become certified an operator must satisfy minimum education and experience requirements and pass the appropriate certification examination. The EPA minimum requirements for certification are:

- Education - The operator must possess a high school diploma or general equivalency diploma (GED). States may allow experience and/or training to be substituted for the education requirement.
- Experience - The operator must meet the State’s on-the-job experience requirement.
- Examination - The operator must pass a certification exam. The exam will cover the knowledge, skills, ability and judgment necessary to operate systems within the State.

Current operators that do not meet these newly imposed requirements may be eligible to be grandparented through the State Certification Program. If grandparenting is allowed by the State Certification Program, operators may be permitted to become certified, with the system owner’s consent, without meeting all of the certification requirements. This is a restricted certificate and grandparented operators must meet all certification renewal requirements.

Among other restrictions, the *Guidelines* specify that “grandparenting is permitted only to existing operator(s) in responsible charge of existing systems which, because of State law changes to meet these guidelines, must for the first time have a certified operator.” If allowed by the State, “certification for the grandparented operator must be site specific and non-transferable to other operators.” “If the classification of the plant or distribution system changes to a higher level, then the grandparented certification will no longer be valid”;

1. Environmental Protection Agency, 1999. *Final Guidelines for the Certification and Recertification of the Operators of Community and Nontransient Noncommunity Public Water Systems*. *Federal Register*, Vol. 64, No. 24–Friday, February 5, 1999.

and “if the grandparented operator chooses to work for a different water system, he or she must meet the initial certification requirements of that system” (p. 5920, section II.C.3).

Renewal

Operators that meet the certification requirements and pass the certification exam will be certified by the State Certification Program for a specific period of time. The *Guidelines* require certificates to be renewed within a period of three years. Operators must attend State approved training in order to renew their certificates.

Need-to-Know Job Tasks and Capabilities

ABC conducted a very small water system operator job analysis to identify the most critical job tasks performed by operators and the capabilities required to competently perform these job tasks. Over 450 operators were surveyed by ABC as part of this process. In the survey, operators provided data on how frequently job tasks are performed and the potential seriousness of performing these tasks incorrectly.

The results of this survey were used to develop the following Need-to-Know Criteria. The Need-to-Know Criteria is a list of the subjects that a small water system operator needs to know to properly operate a system. Tasks and their requisite capabilities performed by at least 50% of the survey respondents and with a high seriousness rating are included in this list. This list includes both community and nontransient noncommunity public water systems. Examples of nontransient noncommunity systems include schools, day-care centers, and factories.

This type of information is used as the basis for developing certification exams.

Evaluate characteristics of source water	
Job tasks	Capabilities
Evaluate characteristics of source water, such as:	Ability to communicate observations verbally and in writing
Bacteriological	Ability to discriminate between normal/abnormal conditions
Biological	Knowledge of normal characteristics of water
Chemical	Knowledge of wellhead protection
Physical	
Operate system	
Job tasks	Capabilities
Add liquid disinfectants	Ability to adjust disinfectant feed rates
Monitor, evaluate, adjust chlorine disinfection	Ability to calculate dosage rates
Inspect, maintain, repair flow measurements	Ability to confirm disinfectant strength
Inspect, maintain, repair well operation	Ability to diagnose/troubleshoot process units
Perform leak detection	Ability to interpret Material Safety Data Sheets
	Ability to maintain processes in normal operating condition
	Ability to measure disinfectant weight and volume
	Ability to perform basic math
	Ability to prepare and apply disinfectants
	Knowledge of general biology and chemistry
	Knowledge of disinfectant concepts and properties
	Knowledge of disinfectant processes and design parameters
	Knowledge of general electrical and mechanical principles
	Knowledge of normal chemical range
	Knowledge of personal protective equipment
	Knowledge of principles of measurement
	Knowledge of proper handling and storage of disinfectants
	Knowledge of proper lifting procedures
	Knowledge of regulations

Need-to-Know Criteria (Continued)

Collect, perform, and interpret laboratory analyses	
Job tasks	Capabilities
Collect, perform, and interpret laboratory analyses, such as:	Ability to calibrate instruments
Chlorine demand	Ability to follow written procedures
Chlorine residual	Ability to interpret Material Safety Data Sheets
Microbiological	Ability to perform disinfection calculations
	Ability to recognize abnormal analytical results
	Knowledge of general chemistry
	Knowledge of laboratory equipment
	Knowledge of principles of measurement
	Knowledge of proper disinfectant handling and storage
	Knowledge of proper safety procedures
	Knowledge of proper sampling techniques and procedures
	Knowledge of quality control and assurance practices
	Knowledge of regulations, such as the Safe Drinking Water Act
Establish safety plans and apply safety procedures	
Job tasks	Capabilities
Establish safety plans and apply safety procedures, in areas such as:	Ability to communicate safety hazards verbally and in writing
Chemical hazard communication	Ability to demonstrate safe work habits
Confined space entry	Ability to follow written procedures
Electrical grounding	Ability to identify potential hazards and unsafe work conditions
General safety and health	Ability to operate safety equipment
Lifting	Knowledge of potential impact of disasters on facility
Lock-out/tag-out	Knowledge of regulations
Personal hygiene	Knowledge of risk management
Personal protective equipment	
Slips, trips, and falls	
Operate equipment	
Job tasks	Capabilities
Operate equipment, such as:	Ability to evaluate and adjust operation of equipment
Chemical feeders	Ability to monitor electrical and mechanical equipment
Electronic testing equipment	Knowledge of disinfection concepts
Instrumentation	Knowledge of function of tools
Motors	Knowledge of general electrical and mechanical principles
Power tools	Knowledge of proper safety procedures
Pumps	Knowledge of regulations
	Knowledge of start-up/shut-down procedures

Need-to-Know Criteria (Continued)

Evaluate operation of equipment	
Job tasks	Capabilities
Check speed of equipment	Ability to adjust equipment
Inspect equipment for abnormal conditions	Ability to calibrate equipment
Perform maintenance on chemical feeders	Ability to diagnose/troubleshoot process units
Perform maintenance on pumps	Ability to discriminate between normal/abnormal conditions
Read meters	Ability to follow written procedures
Read pressure gauges	Ability to monitor electrical and mechanical equipment
	Ability to perform general maintenance and repairs
	Ability to record information
	Ability to report findings
	Ability to use hand tools
	Knowledge of facility operation and maintenance
	Knowledge of general electrical and mechanical principles
	Knowledge of proper safety procedures
	Knowledge of safety regulations
	Knowledge of start-up/shut-down procedures
Perform administrative duties	
Job tasks	Capabilities
Establish recordkeeping system for facility operation	Ability to communicate verbally and in writing
Organize work activities	Ability to demonstrate safe work habits
Record information relating to facility performance	Ability to determine what information needs to be recorded
Write reports	Ability to evaluate facility performance
	Ability to follow written procedures
	Ability to identify potential hazards and unsafe work conditions
	Ability to interpret and transcribe data
	Ability to operate safety equipment
	Ability to perform basic math
	Knowledge of facility operation and maintenance
	Knowledge of monitoring and reporting requirements
	Knowledge of recordkeeping function and policies
	Knowledge of regulations

Exam Specifications

The very small water system certification exam evaluates an operator's knowledge, skills, ability and judgment related to the operation of very small water systems. The Need-to-Know Criteria presented in the previous section of this guidebook results in the recommended specifications shown below for an exam. Each state determines the content of its certification exams. Please contact your State Certification Program listed in the last section of the guidebook for any information they may provide to applicants.

Recommended Very Small Water System Exam Specifications

Job Duty	Percent of Exam
Evaluate characteristics of source water	7%
Operate system	18%
Collect, perform, and interpret laboratory analyses	11%
Establish safety plans and apply safety procedures	25%
Operate equipment	10%
Evaluate operation of equipment	13%
Perform administrative duties	16%

Please refer to the Need-to-Know Criteria on the previous pages for a listing of the tasks and capabilities associated with each job duty.

Sample Test Questions

The following questions are provided as examples of the types of questions that might be covered on your certification exam. These questions may help prepare you for certification by identifying areas in which you need additional study. The correct answers and reference material for each question are found in the following section. If you cannot answer a question correctly, read the reference material listed for the question. The reference material will help you better understand the topic and may help you answer similar questions that may be on the certification exam.

It is unlikely that you will find any of these question duplicated on a certification exam, so don't try to memorize the questions and answers. Many operators find it is helpful to contact their State Certification Program listed in the last section of the guidebook to request information about the certification exam. Some, but not all, certification programs will provide a list of suggested study material, topics covered on the exam and sample exam questions.

These sample questions should not be used in place of other training materials and courses. The “Training Opportunities and Resources” section of this guidebook contains additional information.

1. If a customer complains about the drinking water characteristics, the operator should record the complaint and
 - A. Investigate immediately
 - B. Investigate only if more complaints are received
 - C. Inform the customer that the water should be boiled
 - D. Inform the customer that the water is safe
2. What term is used when a water utility divides its total operating expenses into the total revenue?
 - A. Debt ratio
 - B. Operating ratio
 - C. Credit ratio
 - D. Coverage ratio
3. How often should operation data, such as flow rate, amount of water treated, dosage of chemical, and reservoir levels be recorded?
 - A. Twice a day
 - B. Daily
 - C. Weekly
 - D. Monthly
4. Which of the following is the most important reason to keep daily records of operational data?
 - A. Maintain records for customer billing
 - B. Document the need for an increased budget
 - C. Provide insurance data
 - D. Document that safe drinking water has been delivered to customers
5. Under the requirements of the Safe Drinking Water Act, it is the duty of the water purveyor to deliver potable water of proper quantity only as far as the
 - A. Entry point of the distribution system
 - B. Customer's curb box and service connection
 - C. Consumer's tap inside the home
 - D. Furthest water main blow-off or sampling point

6. According to the Safe Drinking Water Act, the basic definition of a public water supply system is any water system that supplies water for human consumption that serves
 - A. 25 homes or more for over 120 days a year
 - B. The public in any capacity, no matter how small
 - C. 25 or more persons for at least 30 days a year
 - D. 15 service connections or over 25 persons for over 60 days a year

7. What agent is responsible for reporting lab results to the regulatory agency?
 - A. Water system owner
 - B. Board of Health chairperson
 - C. Lab technician
 - D. Sample collector

8. According to the USEPA drinking water regulations, the owner or operator of a public water system which fails to comply with applicable monitoring requirements must give notice to the public within
 - A. 45 days of the violation by posting a notice at the town hall
 - B. 1 year of the violation by including a letter with the water bill
 - C. 3 months of the violation in a daily newspaper in the area served by the system
 - D. 1 week of the violation in a letter hand delivered to customers

9. What federal law is designed to protect the safety and health of operators?
 - A. OSHA
 - B. FMLA
 - C. FLSA
 - D. ADEA

10. What federal law regulates public water supplies?
 - A. Safe Drinking Water Act
 - B. Clean Water Act
 - C. Taft-Hartley Act
 - D. Standard Methods

11. What causes water to move through pores in soil and rocks?
 - A. Temperature
 - B. Viscosity
 - C. Barometric pressure
 - D. Gravity

12. What is a commonly used indicator of possible health problems found in plants, soil, water and the intestines of humans and warm-blooded animals?
 - A. Viruses
 - B. Coliform bacteria
 - C. Intestinal parasites
 - D. Pathogenic organisms

13. What are disease producing bacteria called?
 - A. Parasites
 - B. New strain
 - C. Sour type
 - D. Pathogenic

14. What are the two main causes of hardness in water?
- A. Gold and silver
 - B. Calcium and magnesium
 - C. Phosphate and nitrate
 - D. Oxygen and methane
15. Which source of water has the greatest natural protection from bacterial contamination?
- A. Shallow well
 - B. Deep well in gravel
 - C. Surface water
 - D. Spring
16. What device measures the flow rate of gases?
- A. Parshall flume
 - B. Rotameter
 - C. Float
 - D. Weir
17. How often should preventive maintenance for equipment be performed?
- A. Once every week
 - B. After a breakdown
 - C. According to manufacturer recommendations
 - D. When time permits
18. Dynamic head is best described as the
- A. Velocity of water in a main at full pumping pressure
 - B. Total energy that a pump must develop for pumping to take place
 - C. Total pressure in feet of head, measured at the pump discharge during periods of rest in the system
 - D. Pumping end of any device used to force water into a pressure system
19. Which of the following terms refers to excessive internal pressure, which may be several times the normal operating pressure and can seriously damage hydropneumatic tanks, valves, and the piping network?
- A. Air charge
 - B. Flow rate pressure
 - C. Water hammer
 - D. Hydraulic charge
20. Which of the following should an operator investigate first when well pump and control problems occur?
- A. Depth of supply
 - B. Piping
 - C. Electricity
 - D. Water leaks
21. Most pumps must be primed before startup in order to
- A. Calculate flow rate
 - B. Prevent reverse flow
 - C. Start the flow of water
 - D. Prevent hammer

22. What is the purpose of a check valve?
- Regulate the rate of flow through the discharge pipe
 - Act as automatic shutoff valve when the pump stops
 - Permit air to escape from the pipe
 - Prevent clogging of the suction line
23. What is the primary purpose of a preventive maintenance program?
- Increase the use of backup equipment
 - Correct equipment breakdowns
 - Eliminate inventory of spare parts
 - Avoid future equipment problems
24. A mixture of air and gas is considered hazardous when the mixture exceeds what percentage of the lower explosive limit (LEL)?
- 0%
 - 3%
 - 7%
 - 10%
25. Which of the following duties should not be performed by a small system operator?
- Disinfect water mains
 - Observe pump motors to detect unusual noises, vibrations or excessive heat
 - Repair and overhaul chlorinators
 - Wire pump, compressors and electrical components of the water system
26. What are the most important methods of ensuring operator safety?
- Appointing a safety officer and administrator
 - Alerting operators of unsafe acts and conducting mandatory safety training
 - Providing handbooks and copies of regulations
 - Working with proper light and ventilation
27. What safety procedure should an operator always follow when mixing a solution of sodium hypochlorite (liquid bleach) and fresh water?
- Attend a training course on liquid chlorine from an accredited school
 - Wear gloves and a mask when opening the containers of bleach
 - Ask a second individual to stand nearby with an emergency breathing apparatus
 - Wear goggles and gloves when handling hypochlorite
28. Which form of hypochlorite is the most dangerous to handle?
- Sodium
 - Fluoride
 - Calcium
 - Chlorine
29. What are the two most important safety concerns when entering a confined space?
- Corrosive chemicals and falls
 - Bad odors and claustrophobia
 - Extreme air temperatures and slippery surfaces
 - Oxygen deficiency and hazardous gases

30. What piece of safety equipment must an operator wear when entering a confined space?
- A. Boots
 - B. Harness
 - C. Gloves
 - D. Goggles
31. What type of fire extinguisher should be used for fires with live electricity present?
- A. Class A
 - B. Class B
 - C. Class C
 - D. Class D
32. Which document provides a profile of hazardous substances?
- A. CERCLA
 - B. SARA
 - C. CFR
 - D. MSDS
33. What safety measure must an operator follow prior to working on electrical equipment?
- A. Lock out and tag out all electrical switches
 - B. Put on canvas gloves
 - C. Remove fuses from switch box
 - D. Tell one coworker not to turn on the switch
34. What is the correct procedure for mixing acid and water?
- A. Water is added slowly to the acid
 - B. Acid is added slowly to the water
 - C. Water is added quickly to the acid
 - D. Acid is added quickly to the water
35. What is the purpose of a pump guard?
- A. Allows operators to turn off pump in emergency situations
 - B. Notifies operators of excessive temperatures
 - C. Allows operators to pump against a closed discharge valve
 - D. Protects operators from rotating parts
36. The most important responsibility of an operator is to provide
- A. Adequate water pressure
 - B. Palatable drinking water
 - C. Adequate amounts of water
 - D. Safe drinking water
37. To ensure that the water supplied by a public water system meets federal and state requirements, the water system operator must regularly collect samples and
- A. Test the water at the nearest water testing laboratory
 - B. Determine a sampling schedule based on the lab's recommendations
 - C. Send all analysis results to the State periodically
 - D. Count the number of active wells in the system

38. The major source of error when obtaining water quality information is improper
- Sampling
 - Preservation
 - Tests of samples
 - Reporting of data
39. A composite sample should never be used when sampling for which contaminant?
- Benzene
 - Nitrate
 - Barium
 - Bacteria
40. When should water quality samples for chlorine residual be analyzed?
- Immediately
 - Within 1 hour
 - Within 8 hours
 - Within 24 hours
41. How many coliform samples are required per month for a water system serving a population between 25 and 100?
- 1
 - 2
 - 3
 - 4
42. Water laboratory test calculations and results use which system?
- English
 - Metric
 - SWAG
 - British
43. Factors of what number are used in the metric system?
- 5
 - 10
 - 12
 - 64
44. What is the chemical formula for sulfuric acid?
- SA₂
 - H₂SO₄
 - NaOH
 - H₂O
45. Which of the following should not be used to draw a sample into a pipet?
- Mouth
 - Bulb
 - Pump
 - Straw

46. Which of the following are two types of samples?
- Dessicator and gooch
 - Wet and dry
 - Buret and flask
 - Grab and composite
47. What two types of devices are used to collect samples?
- Left and right
 - Upper and lower
 - Automatic and manual
 - Gas and diesel
48. How should samples that cannot be analyzed immediately be maintained until the analysis is conducted?
- Shaken every hour
 - Preserved
 - Held in an open container
 - Stored bottom up
49. What is the most common method used in labs to test for total coliform and *E. coli*?
- DMA
 - Green
 - Colilert
 - Lamp
50. What test method best determines chemical feed/dosage rates?
- Jar
 - Turbidity
 - Hammer
 - Hardness
51. An empty atmospheric storage tank is 8 feet in diameter and 32 feet high. How long will it take to fill 90% of the tank volume if a pump is discharging a constant 24 gallons per minute into the tank?
- 7 hours 31 minutes
 - 8 hours 21 minutes
 - 8 hours 23 minutes
 - 9 hours 17 minutes
52. Two columns of water are filled completely at sea level to a height of 88 feet. Column A is 0.5 inches in diameter. Column B is 5 inches in diameter. What will two pressure gauges, one attached to the bottom of each column, read?
- | | <u>Column A</u> | <u>Column B</u> |
|----|-----------------|-----------------|
| A. | 3.8 psi | 38.0 psi |
| B. | 8.8 psi | 8.0 psi |
| C. | 20.3 psi | 20.3 psi |
| D. | 38.0 psi | 38.0 psi |

53. A ditch that is 4.5 feet wide, 6 feet deep, and 120 feet long has to be dug for a water line. How many cubic yards of material must be removed?
- A. 120 cubic yards
 - B. 240 cubic yards
 - C. 850 cubic yards
 - D. 1,200 cubic yards
54. How many cubic feet of water will a rectangular tank that is 20 feet long by 15 feet wide and 10 feet high hold?
- A. 2,000 cubic feet
 - B. 3,000 cubic feet
 - C. 4,000 cubic feet
 - D. 5,000 cubic feet
55. Calculate the chlorine demand using the following data.
- Raw water flow is 0.75 MGD.
 - Chlorinator feed rate is 4.0 mg/L.
 - Chlorine residual is 1.8 mg/L.
- A. 0.8 mg/L
 - B. 2.2 mg/L
 - C. 4.0 mg/L
 - D. 5.8 mg/L
56. Convert 60.5 degrees Fahrenheit to degrees Celsius.
- A. 15.8 degrees Celsius
 - B. 20.6 degrees Celsius
 - C. 72.0 degrees Celsius
 - D. 101.2 degrees Celsius
57. Calculate drawdown, in feet, using the following data.
- The water level in a well is 20 feet below the ground surface when the pump is not in operation.
 - The water level is 35 feet below the ground surface when the pump is in operation.
- A. 15 feet
 - B. 20 feet
 - C. 35 feet
 - D. 55 feet
58. Calculate the volume, in gallons, of a tank that is 75 feet long, 20 feet wide, and 10 feet deep.
- A. 15,000 gallons
 - B. 112,200 gallons
 - C. 150,000 gallons
 - D. 224,400 gallons
59. How many pounds of a chemical applied at the rate of 3 mg/L are required to dose 200,000 gallons?
- A. 3 lbs
 - B. 5 lbs
 - C. 16 lbs
 - D. 50 lbs

60. Calculate the average weekly flow for a system with the following data.
- | | | |
|---------------------------|--------------------------|-------------------------|
| Sunday - 3,000 gallons | Monday - 4,000 gallons | Tuesday - 3,500 gallons |
| Wednesday - 2,000 gallons | Thursday - 3,000 gallons | Friday - 3,500 gallons |
| Saturday - 2,000 gallons | | |
- A. 2,000 gpd
B. 3,000 gpd
C. 4,000 gpd
D. 5,000 gpd
61. After a new water main is installed and pressure tested it should be
- A. Flushed with clean water for 24 hours and put into service
B. Filled with a solution of 25 ppm to 50 ppm free chlorine for at least 24 hours prior to flushing
C. Filled with clean water and allowed to sit for 5 days at full pressure before turning the water into the system
D. Photographed so that mapping can be avoided until the system is complete
62. Chlorine demand is satisfied at the point when
- A. The reaction of chlorine with organic and inorganic materials stops
B. Free chlorine residuals reach 2.5 mg/L
C. An odor of chlorine is present
D. Chlorine reaches the last tap
63. What chlorine concentration should be produced when disinfecting a well or well pump?
- A. 25 mg/L
B. 50 mg/L
C. 75 mg/L
D. 100 mg/L
64. When disinfecting a new or repaired main, what is the minimum chlorine residual at the extreme end of the main after standing for 24 hours?
- A. 15 mg/L
B. 20 mg/L
C. 25 mg/L
D. 30 mg/L
65. Chlorine will destroy bacteria most rapidly at what pH?
- A. 7.5
B. 8.5
C. 9.5
D. 10.5
66. What is the process of adding chlorine to water until the chlorine demand has been satisfied called?
- A. Contact time
B. Reliquefaction
C. Hypochlorination
D. Breakpoint chlorination

67. Which of the following pH ranges would deposit a thin film of calcium carbonate on the inside surface of a pipe?
- A. 2.0 - 3.0
 - B. 4.0 - 5.0
 - C. 6.0 - 7.0
 - D. 8.0 - 9.0
68. Where should sodium hypochlorite (liquid bleach) be stored?
- A. Away from flammable objects, as it is a fire hazard
 - B. Away from equipment that is susceptible to corrosion
 - C. In closed containers at room temperature for no longer than 6 months
 - D. Near the chemical feed pump day tank, to lessen operator handling risks
69. What is the most important reason for maintaining a continuous positive pressure throughout the distribution system?
- A. Prevent damage to water meters
 - B. Keep pipe joints sealed
 - C. Prevent contamination from backflow
 - D. Maintain chlorine residual
70. A weir should be used to measure water in which of the following locations?
- A. Above ground storage tanks
 - B. Household service lines
 - C. Open channels
 - D. Water mains
71. The pumping water level is best defined as the distance from the top of the well to the
- A. Intake screen of the pump
 - B. Location where the main flow of water enters a well
 - C. Water after the pump has been operating for a period of time
 - D. Water level from the start of a pump test to the end of the test
72. The space between the inner or protective casing and the outer casing or drill hole should be filled with cement grout to a minimum of how many feet?
- A. 10 feet
 - B. 15 feet
 - C. 20 feet
 - D. 35 feet
73. When bringing community water service to a home with a private well, what is the most positive method of preventing a cross connection between the two systems?
- A. Residential dual check valve
 - B. Reduced pressure zone backflow preventer
 - C. Complete isolation between the two systems using an air gap
 - D. Pressure vacuum breaker in addition to an RPZ

74. What is the physical connection, direct or indirect, which provides the opportunity for nonpotable water to enter a conduit, pipe or receptacle containing potable water?
- A. Well testing
 - B. Pump injection
 - C. Bell joint clamp
 - D. Cross connection
75. Which of the following causes taste problems and has a rotten egg odor?
- A. Chlorine
 - B. Benzene
 - C. Nitrate
 - D. Hydrogen sulfide

References and Correct Answers

Information on obtaining the references listed below may be found in the “Training Opportunities and Resources” section of this guidebook.

1. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 1
Answer: A
2. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 8.
Answer: B
3. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 4.
Answer: B
4. Reference: *Water Distribution System Operation and Maintenance, A Field Study Training Program*, American Water Works Association, Ch. 1.
Answer: D
5. Reference: *Water Distribution Operator Training Handbook*, American Water Works Association, Ch. 4.
Answer: C
6. Reference: *Water Distribution Operator Training Handbook*, American Water Works Association, Ch. 3.
Answer: D
7. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: A
8. Reference: USEPA 40 *Code of Federal Regulations* 141.32(b)(1)
Answer: C
9. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 6.
Answer: A
10. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 2.
Answer: A
11. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 3.
Answer: D
12. Reference: *Water Distribution System Operation and Maintenance*, California State University, Ch. 6.
Answer: B
13. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: D
14. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: B
15. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 3.
Answer: B

16. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 5.
Answer: B
17. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 4.
Answer: C
18. Reference: *Basic Science Concepts and Applications*, American Water Works Association, Ch. 6.
Answer: B
19. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 3.
Answer: C
20. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 3.
Answer: C
21. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 3.
Answer: C
22. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 3.
Answer: B
23. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 4.
Answer: D
24. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 6.
Answer: D
25. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 1.
Answer: D
26. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 6.
Answer: B
27. Reference: *Water Distribution Operator Training Handbook*, American Water Works Association, Ch. 19.
Answer: D
28. Reference: *Introduction to Water Treatment, Principles and Practices of Water Supply Operations*, American Water Works Association, Vol. 2.
Answer: C
29. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 6.
Answer: D
30. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 6.
Answer: B
31. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: C
32. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 6.
Answer: D

33. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 6.
Answer: A
34. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 6.
Answer: B
35. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 6.
Answer: D
36. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 1.
Answer: D
37. Reference: *Water Distribution Operator Training Handbook*, American Water Works Association Ch. 3.
Answer: C
38. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: A
39. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: D
40. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: A
41. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 5.
Answer: A
42. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: B
43. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: B
44. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: B
45. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: A
46. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: D
47. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: C
48. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: B
49. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
Answer: C

50. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
 Answer: A
51. Reference: *Basic Science Concepts and Applications*, American Water Works Association, Ch. 10 and 11.
 Answer: A
 Solution: $8 \text{ feet} \times 8 \text{ feet} \times 32 \text{ feet} \times .785 = 1607.68 \text{ cu ft}$
 $1607.68 \text{ cu ft} \times 7.48 \text{ gallons per cu ft} = 12,025 \text{ gallons}$
 $12,025 \text{ gallons} \times 0.90 = 10,823 \text{ gallons}$
 $10,823 \text{ gallons} / 24 \text{ gpm} = 451 \text{ minutes}$
 $451 \text{ minutes} = 7 \text{ hours } 31 \text{ minutes}$
52. Reference: *Water Distribution Operator Training Handbook*, American Water Works Association, Ch. 2.
 Answer: D
 Solution: $88 \text{ feet} \times 0.433 = \text{approximately } 38 \text{ psi.}$
53. Reference: *Small Water System Operation and Maintenance*, California State University, Appendix.
 Answer: A
 Solution: $3 \text{ ft} \times 3 \text{ ft} \times 3 \text{ ft} = 27 \text{ cubic yards}$
 $4.5 \text{ ft} \times 6 \text{ ft} \times 120 \text{ ft} / 27 \text{ cubic yards} = 120 \text{ cubic yards}$
54. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 5.
 Answer: B
 Solution: $20 \text{ ft} \times 15 \text{ ft} \times 10 \text{ ft} = 3,000 \text{ cubic feet}$
55. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
 Answer: B
 Solution: $4.0 \text{ mg/L} - 1.8 \text{ mg/L} = 2.2 \text{ mg/L}$
56. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
 Answer: A
 Solution: $60.5^\circ \text{ F} - 32 / 1.8 = 15.8^\circ \text{ C}$
57. Reference: *Small Water System Operation and Maintenance*, California State University, Appendix.
 Answer: A
 Solution: $35 \text{ feet} - 20 \text{ feet} = 15 \text{ feet}$
58. Reference: *Small Water System Operation and Maintenance*, California State University, Appendix.
 Answer: B
 Solution: $75 \text{ ft} \times 20 \text{ ft} \times 10 \text{ ft} = 15,000 \text{ cu ft}$
 $15,000 \text{ cu ft} \times 7.48 \text{ gal/cu ft} = 112,200 \text{ gal}$
59. Reference: *Small Water System Operation and Maintenance*, California State University, Appendix.
 Answer: B
 Solution: $3 \text{ mg/L} \times 0.2 \text{ MGD} \times 8.34 \text{ lbs/gal} = 5 \text{ lbs}$

60. Reference: *Small Water System Operation and Maintenance*, California State University, Appendix.
 Answer: B
 Solution: $3,000 + 4,000 + 3,500 + 2,000 + 3,000 + 3,500 + 2,000 = 21,000$ gal
 $21,000$ gallons per week / 7 days per week = 3,000 gallons per day
61. Reference: *Water Transmission and Distribution*, American Water Works Association, Ch. 5.
 Answer: B
62. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 5.
 Answer: A
63. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 7.
 Answer: B
64. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 5.
 Answer: C
65. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 5.
 Answer: A
66. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 5.
 Answer: D
67. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 4.
 Answer: D
68. Reference: *Water Treatment*, American Water Works Association, Ch. 7.
 Answer: B
69. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 5.
 Answer: C
70. Reference: *Small Water System Operation and Maintenance*, California State University, Appendix -
 Water Words.
 Answer: C
71. Reference: *Water Distribution Operator Training Handbook*, American Water Works Association, Ch. 16.
 Answer: C
72. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 3.
 Answer: A
73. Reference: *Water Distribution Operator Training Handbook*, American Water Works Association, Ch.
 14.
 Answer: C
74. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 3.
 Answer: D
75. Reference: *Small Water System Operation and Maintenance*, California State University, Ch. 5.
 Answer: D

Training Opportunities and Resources

There are many sources of training for very small water system operators. Operator training classes may be offered by the American Water Works Association (AWWA), local water utilities, community colleges, vocational-technical schools, and so on. Training must be approved by the State to satisfy the certification and training requirements. Therefore, it is important to contact your State Certification Program listed in the next section of the guidebook for a list of State-approved training.

In addition to training opportunities available in your state, there are general reference materials that may help prepare you for certification. The following is a partial list of reference material available in the United States.

California State University, Sacramento

- *Small Water System Operation and Maintenance*
- *Water Distribution System Operation and Maintenance*
- *Water Treatment Plant Operation, Vol. I & II*

Materials may be ordered from:

Office of Water Programs
California State University, Sacramento
6000 J Street
Sacramento, CA 95819
Phone: (916) 278-6142
E-mail: wateroffice@csus.edu
Web site: <http://www.owp.csus.edu>

American Water Works Association

- *Water Distribution Operator Training Handbook*
- *Water Distribution System Operation and Maintenance, A Field Study Training Program*
- *Introduction to Water Treatment, Principles and Practices of Water Supply Operations*
- *Water Transmission and Distribution*
- *Water Treatment*
- *Basic Science Concepts and Applications*
- *Design and Construction of Small Water Systems*

Materials may be ordered from:

AWWA Customer Service
6666 W. Quincy Avenue
Denver, CO 80235
Phone: (800) 926-7337
E-mail: custsvc@awwa.org
Web site: <http://www.awwa.org>

State Certification Programs

Alabama Water & Wastewater Operator Certification Program

Water Division
AL Dept. of Environmental Mgmt.
P.O. Box 301463
Montgomery, AL 36130-1463
Phone: (334) 274-4221
Web site: <http://www.adem.state.al.us/h2owebpg.html>

Alaska Department of Environmental Conservation, Facility Construction & Operation

Operations Assistance Unit
410 Willoughby Ave., Ste. 105
Juneau, AK 99801-1795
Phone: (907) 465-5140
Web site: http://www.state.ak.us/local/akpages/ENV.CONSERV/dfco/dec_dfco.htm

Arizona Operator Certification Program

Arizona DEQ
3033 N. Central Av., Rm 214, MO 248B
Phoenix, AZ 85012-2801
Phone: (602) 207-4643
Web site: <http://www.adeq.state.az.us/environ/water/dw/opcert.html>

Arkansas Drinking Water Advisory and Operators Licensing Committee

Dept. of Health
4815 W. Markham St. MS37
Little Rock, AR 72205-3867
Phone: (501) 661-2623
Web site: <http://health.state.ar.us/eng/operfram.htm>

California Water Treatment Operator Certification

DHS, Certification Unit, MS 92
601 North 7th Street
P.O. Box 942732
Sacramento, CA 94234-7320
Phone: (916) 323-1221
Web site: <http://www.dhs.ca.gov/ps/ddwem/technical/dwp/dwpindex.htm>

Colorado Plant Operators Certification Board

4300 Cherry Creek Drive South
Denver, CO 80246-1530
Phone: (303) 692-3558
Web site: <http://www.cdphe.state.co.us>

Connecticut Department of Public Health - Water Supplies Section

410 Capitol Ave., MS #51 WAT
Hartford, CT 06134-0308
Phone: (860) 509-7333
Web site: <http://www.state.ct.us/dph/>

Delaware Office of Drinking Water

Department of Public Health
Blue Hen Corp. Center, Suite 203
655 S. Bay Road
Dover, DE 19901-4615
Phone: (302) 739-5410

Florida DEP Water/Wastewater Operator Certification Program

Bureau of Water Facilities Funding
2600 Blair Stone Rd., MS 3506
Tallahassee, FL 32399-2400
Phone: (850) 921-4019
Web site: <http://www.dep.state.fl.us/water/wff/ocp/default.htm>

Georgia Board of Examiners for Certification of Water & Wastewater Treatment Plant Operators & Laboratory Analysts

State Examining Boards
237 Coliseum Drive
Macon, GA 31217-3858
Phone: (912) 207-1400
Web site: <http://www.sos.state.ga.us/ebd-water/>

Hawaii Board of Certification of Operating Personnel in Water Treatment Plants

Safe Drinking Water Branch
Env. Mgmt. Divn., State Dept./Health
919 Ala Moana Blvd., Room 308
Honolulu, HI 96814-4920
Phone: (808) 586-4258
Web site: <http://mano.icsd.hawaii.gov/doh/rules/ei1125.html>
(Regulations document)

Idaho Water & Wastewater Operators Certification Boards Inc.

IWWOCB Inc.
P.O. Box 551
Lewiston, ID 83501-0551
Phone: (208) 750-1195

Illinois Drinking Water Operator Certification Program

IL EPA, Compliance Assur. Sect. #19
1021 North Grand Ave. East
P.O. Box 19276
Springfield, IL 62794-9276
Phone: (217) 785-0561
Web site: <http://www.epa.state.il.us/water/drinking-water-operator>

Indiana Department of Environmental Management

100 N. Senate Avenue
P.O. Box 6015
Indianapolis, IN 46206-6015
Phone: (317) 308-3307
Web site: <http://www.state.in.us/idem/owm/index.html>

Iowa Operator Certification Program

Water Supply Section
IA Dept. of Natural Resources
502 East 9th St.
Des Moines, IA 50319
Phone: (515) 281-8998
Web site: <http://www.state.ia.us/epd/wtrq/opercert.htm>

Kansas Water and Wastewater Operator Certification

Kansas Dept. of Health & Env't.
Forbes Field, Bldg. # 283
Topeka, KS 66620-0001
Phone: (785) 296-2976
Web site: <http://www.kdhe.state.ks.us/water/tech.html>

Kentucky Board of Certification of Water Treatment & Distribution System Operators

KY DEP, Division of Water
14 Reilly Road
Frankfort, KY 40601-1189
Phone: (502) 564-3410
Web site: <http://water.nr.state.ky.us/dow/trngcat.htm>

Louisiana Committee of Certification for Water and Wastewater Operators

LA Dept. of Health
Operator Certification Program
6867 Bluebonnet Blvd., Box 6
Baton Rouge, LA 70810
Phone: (225) 765-5058

Maine Board of Licensure of Water Treatment Plant Operators

ME Drinking Water Program
157 Capitol Street
10 State House Station
Augusta, ME 04333-0010
Phone: (207) 287-5678
Web site: <http://janus.state.me.us/dhs/eng/water/operator.htm>

Maryland State Board of Waterworks and Waste Systems Operators

2500 Broening Highway
Baltimore, MD 21224-6617
Phone: (410) 631-3167
Web site: http://www.mde.state.md.us/permit/permit_guide98/index.html
(Permit Guide document)

Massachusetts Board of Certification of Operators of Drinking Water Supply Facilities

Massachusetts DEP
Division of Water Supply
One Winter Street, 6th Floor
Boston, MA 02108
Phone: (617) 556-1191
Web site: <http://www.state.ma.us/reg/boards/dw/default.htm>

Michigan Advisory Board of Examiners

Environmental Assistance Division
Town Center Building
333 S. Capitol Ave., 2nd Floor
Lansing, MI 48933-2022
Phone: (517) 373-4752
Web site: <http://www.deq.state.mi.us/ead/tasect/otu/>

Minnesota Advisory Council on Water Supply Systems & Wastewater Treatment Facilities

MN Dept./Health, Drinking Water Prot.
121 East 7th Place, Suite 220
P.O. Box 64975
St. Paul, MN 55164-0975
Phone: (651) 215-0751
Web site: <http://www.health.state.mn.us/divs/eh/dwp/pws/dwopcert/dwopmain.html>

Mississippi State Department of Health

Division of Water Supply
2423 North State Street, Ste. 241
P.O. Box 1700
Jackson, MS 39215-1700
Phone: (601) 576-7518
Web site: <http://www.msdh.state.ms.us/watersupply/index.htm>

Missouri Department of Natural Resources

Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102-0176
Phone: (800) 361-4827
or (573) 751-1600
Web site: <http://www.dnr.state.mo.us/deq/tap/oprtrain.htm>

Montana Water and Wastewater Operators' Advisory Council

Department of Envir. Quality
Community Services Bureau
P.O. Box 200901
Helena, MT 59620-0901
Phone: (406) 444-2691
Web site: <http://www.deq.state.mt.us/pcd/csb/certify.htm>

Nebraska Department of Health & Human Services

Dept./Reg. & Licensure
301 Centennial Mall South
P.O. Box 95007
Lincoln, NE 68509-5007
Phone: (402) 471-2541
Web site: <http://www.hhs.state.ne.us>

Nevada State Health Division

NV Bureau of Health Prot. Services
1179 Fairview Dr. Ste. 101
Carson City, NV 89701-5405
Phone: (775) 687-6615 ext. 235
Web site: <http://www.state.nv.us/health/bhps/PHE/sdwp.htm>

New Hampshire Department of Environmental Services

Engineering Bureau, Water Supply
6 Hazen Drive
P.O. Box 95
Concord, NH 03302-0095
Phone: (603) 271-2410
Web site: <http://www.des.state.nh.us/wseb>

New Jersey Water & Wastewater Board of Examiners

NJ DEP Administrator's Office
P.O. Box 420
Trenton, NJ 08625-0420
Phone: (609) 984-7743
Web site: <http://www.state.nj.us/dep>

New Mexico Utility Operators Certification Program

New Mexico Environment Dept.
Facility Oper. Section / SWQB
P.O. Box 26110
Santa Fe, NM 87502-0110
Phone: (505) 827-2799
Web site: <http://www.nmenv.state.nm.us/>

New York Community Water System Operator Certification Program

NY State Dept. of Health
Bureau/Public Water Supply Prot.
Flanigan Square, 547 River St.
Troy, NY 12180-2216
Phone: (518) 402-7712

North Carolina Water Treatment Facility Operators Certification Board

NC DENR, Divn. of Environ. Health
1635 Mail Service Center
Raleigh, NC 27699-1635
Phone: (919) 715-9572
Web site: <http://www.deh.enr.state.nc.us/>

North Dakota Department of Health

1200 Missouri Avenue
P.O. Box 5520
Bismarck, ND 58502-5520
Phone: (701) 328-6626
Web site: <http://www.health.state.nd.us/ndhd/environ/mf/index.htm>

Ohio EPA - Certification Unit

DDAGW
122 South Front Street
P.O. Box 1049
Columbus, OH 43216-1049
Phone: (614) 644-2888
Web site: <http://www.epa.ohio.gov/ddagw/ddagwmain.html>

Oklahoma Waterworks & Wastewater Works Advisory Council

Oklahoma DEQ
Certification and Compliance Section
P.O. Box 1677
Oklahoma City, OK 73101-1677
Phone: (405) 702-8100
Web site: <http://www.deq.state.ok.us/Water1/operatorcertification/>

Oregon Water Operator Certification Program

OR Health Division
Drinking Water Section
P.O. Box 14450
Portland, OR 97293-0450
Phone: (503) 731-4899
Web site: <http://www.ohd.hr.state.or.us/dwp/certif.htm>

Pennsylvania State Board for Certification of Sewage Treatment Plant and Waterworks Operators

DEP - Certif., Licensing & Bonding
400 Market Street, Room 102
P.O. Box 8454
Harrisburg, PA 17105-8454
Phone: (717) 787-5236
Web site: <http://www.dep.state.pa.us/dep/deputate/waterops/>

Rhode Island Drinking Water Certification Board

Department of Health
Office of Drinking Water Quality
3 Capitol Hill, Room 209
Providence, RI 02908-5097
Phone: (401) 222-6867
Web site: <http://www.health.state.ri.us>

South Carolina Environmental Certification Board

110 Centerview Drive
P.O. Box 11409
Columbia, SC 29211-1409
Phone: (803) 896-4430
Web site: <http://www.llr.state.sc.us/ecb.htm>

South Dakota Operator Certification Program

DWP/DENR
Foss Building-Lower Level
523 E. Capitol Ave.
Pierre, SD 57501-3181
Phone: (605) 773-4208
Web site: <http://www.state.sd.us/opercert>

Tennessee Water & Wastewater Operator Certification Board

J R Fleming Training Center
2022 Blanton Drive
Murfreesboro, TN 37129-2912
Phone: (615) 898-8090
Web site: <http://www.state.tn.us/environment/dca/fleming.htm>

Texas Operator Certification Program

TNRCC, MC 178
P.O. Box 13087
Austin, TX 78711-3087
Phone: (512) 239-6139
Web site: <http://www.tnrcc.state.tx.us/enforcement/csd/ocs/>

Utah Water Operator Certification Commission

Utah Divn. of Drinking Water
150 North 1950 West
P.O. Box 144830
Salt Lake City, UT 84114-4830
Phone: (801) 536-4200
Web site: <http://www.deq.state.ut.us/eqdw/>

Vermont Department of Environmental Conservation

Water Supply Division
Old Pantry Building
103 South Main Street
Waterbury, VT 05671-0403
Phone: (802) 241-3400
Web site: <http://www.anr.state.vt.us/dec/watersup/wsd.htm>

Virginia Board for Waterworks and Wastewater Works Operators

Dept. of Profess. and Occup. Reg.
3600 West Broad Street, 5th Floor
Richmond, VA 23230-4917
Phone: (804) 367-8595
Web site: <http://www.state.va.us/dpor/indexne.html>

Washington Water Works Operator Certification Program

Department of Health
Division of Drinking Water
P.O. Box 47822
Olympia, WA 98504-7822
Phone: (360) 236-3137
Web site: <http://www.doh.wa.gov/ehp/dw/>

West Virginia Office of Environmental Health Services

Bureau for Public Health
815 Quarrier Street, Suite 418
Charleston, WV 25301-2616
Phone: (304) 558-2981
Web site: <http://www.wvdhhr.org/oehs/eed/organization.html>

Wisconsin Water and Wastewater Operator Certification Program

Wisconsin DNR
101 S. Webster Street
P.O. Box 7921
Madison, WI 53707-7921
Phone: (608) 266-0498
Web site: <http://www.dnr.state.wi.us/org/es/science/opcert>

Wyoming Operator Certification Program

WY DEQ/Water Quality Division
4th Floor Herschler Building, 4W
122 West 25th Street
Cheyenne, WY 82002-5011
Phone: (307) 777-7781
Web site: <http://deq.state.wy.us/wqd/certop.htm>

