

# **Kansas Small System Water Operator Need to Know**

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Kansas Department of Health and Environment  
Division of Environment  
Bureau of Water  
1000 SW Jackson Street, Suite 420  
Topeka, KS 66612-1367

Healthy Kansans living in safe and sustainable environments

The Kansas Department of Health and Environment (KDHE) has compiled the following minimum knowledge expectations for water operators. The intent of this document is to identify those items which individuals are expected to comprehend in order to serve as water operators. This document is not intended to serve solely as a study guide for operator certification examinations. In order to pass a certification examination, an operator must possess knowledge gained through formal education and training as well as on-the-job experience.

# **Kansas Small System Water Operator Need to Know - Ranked by Priority Within Each Knowledge Area**

## **I. Chlorination/Disinfection**

- Knowledge of disinfection concepts and procedures (e.g., chlorine contact time, residual, demand, dosage)

## **II. Distribution & Pumping**

- Knowledge of pipe disinfection and de-chlorination procedures for new installations and repairs
- Skill to detect water leaks
- Knowledge of the Kansas One Call (e.g., 1-800-DIG-SAFE)
- Knowledge of piping materials (e.g., type and size)
- Knowledge of different types of pipe joints and restraint systems
- Knowledge of engineering drawings and maps
- Skill to locate buried utilities and pipes
- Skill to install and repair buried pipe
- Knowledge of pipe fittings and joining methods
- Skill to inspect and/or replace pumps

## **III. Laboratory/Chemistry**

- Knowledge of testing instruments
- Knowledge of principles of measurement
- Basic knowledge of general chemistry, biology, and physical science
- Knowledge of basic laboratory equipment

## **IV. Management, Source Water Protection & Cross Connection**

- Knowledge of cross-connection control and approved backflow methods and devices
- Knowledge of emergency plans
- Knowledge of potential causes and impact of system disasters
- Skill to communicate verbally and in writing
- Skill to coordinate emergency response with other organizations
- Knowledge of local codes and ordinances
- Skill to assess the likelihood of a disaster occurring
- Knowledge of well-head protection
- Knowledge of customer service and the public participation process
- Skill to translate technical language into common terminology
- Skill to perform impact assessments (i.e., consequences of actions)
- Knowledge of risk management
- Knowledge of the principles of management
- Skill to generate written policies and procedures

## **V. Math**

- Skill to perform basic math (e.g., addition, subtraction, multiplication, division, fractions, basic formulas)

## **VI. Operations Groundwater**

- Knowledge of system operation and maintenance
- Skill to maintain system in normal operating condition
- Knowledge of system start-up and shut-down procedures
- Skill to follow written procedures
- Skill to monitor, evaluate, and adjust equipment
- Skill to order necessary spare parts
- Knowledge of the function and purpose of tools
- Skill to diagnose/troubleshoot system components
- Skill to evaluate system components
- Knowledge of monitoring instruments
- Skill to discriminate between normal and abnormal conditions
- Knowledge of chemical handling and storage
- Skill to recognize normal and abnormal analytical results
- Skill to perform general maintenance and routine housekeeping
- Skill to differentiate between preventive and corrective maintenance
- Knowledge of the principles of public relations
- Knowledge of measuring instruments
- Skill to adjust flow patterns and system components
- Basic knowledge of electric, pneumatic, and hydraulic principles
- Basic knowledge of well construction and maintenance
- Basic knowledge of quality control/quality assurance practices
- Knowledge of source and finish water characteristics
- Skill to calibrate instruments and equipment
- Knowledge of lubricant and fluid characteristics

## **VII. Safety**

- Knowledge of safety procedures
- Skill to identify fire and safety hazards (e.g., electrical, chemical, traffic)
- Skill to interpret Material Safety Data Sheets

## **VIII. Sampling, Recordkeeping, Reporting & Regulatory**

- Knowledge of regulations pertaining to water systems
- Knowledge of the regulatory inspection process
- Knowledge of sampling procedures and requirements
- Knowledge of reporting requirements
- Skill to record information
- Knowledge of water-related professional ethics (e.g., reporting honest and accurate test results)

Small System Water Need to Know (continued)

- Knowledge of primary and secondary standards (e.g., maximum contaminant levels (MCLs))
- Knowledge of public notification requirements
- Skill to record and interpret data
- Knowledge of recordkeeping function and policies
- Skill to organize information and review reports